

Veteran Employees & Dealers Honored on Cooper Anniversary

(Concluded from Page 1, Column 5)

Cooper. Receiving awards were the following members of Cooper's sales organization:

C. J. Bassler, C. G. Rood, Esther Carlson, E. W. Parish, Lee Caswell, J. S. Duncombe, F. J. Mackie, A. S. Irvine, E. E. White, E. G. Cloud, H. Walter Rose, Henry Packer, Kathryn Henry, Harold Hockett, L. A. McKenzie, J. F. Brooks, R. D. Van Kirk, H. F. Arnold, H. W. Nordin, G. H. Mellinger, W. E. Lionheart, F. M. Bush, W. H. Leahy, L. C. Kohlman, and G. R. Larness.

Nine-year dealers, who also received awards, included:

C. Osberg, Riverside Electric Co.; J. Novak and R. Parker, Novak & Parker, Park Ridge; Walter Carey, Carey Electric Co., McHenry; C. J. Haried, Haried Home Appliance Co., Aurora; George Charboneau, Mommence; Andrew Dahle, Galena; H. W. Maas, Hebron; M. A. Hansen, Gardner; J. M. Dieter, Dieter & Getz, Naperville; J. R. Jones, Jones Hardware Co., Plainfield; and C. Kruse, Kruse Hardware Co., Richmond.

Dept. Store Promotion Men to Meet in Boston

BOSTON — Mid-summer conference of the sales promotion division of National Retail Dry Goods Association will be held at the Hotel Statler here June 28 to July 2, in conjunction with the annual convention of the Advertising Federation of America.

Louis E. Kirstein, vice president in charge of merchandise, Wm. Filene's Sons Co., Boston, will open the discussion of present day merchandising methods at the luncheon meeting to be held June 30.

In connection with the sessions, the sales promotion division will conduct its semi-annual promotion clinic, at which present trends in the retail advertising field, will be discussed, and new-business getting ideas presented.

Speeches scheduled on the convention program include: "Retail Copy that Rings the Cash Register," "Evaluating Retail Advertising Appeals," "What's Wrong With Retail Selling," and "Effective Retail Radio Advertising."

Daily to Direct Sales For Printing Firm

CHICAGO—Walter J. Daily, former sales promotion manager of General Electric Co.'s refrigeration department, and later head of his own advertising agency, Walter J. Daily, Inc., has been appointed vice president and director of sales of The Manz Corp., Chicago printing firm.

Mr. Daily was sales promotion manager of the General Electric Co.'s refrigeration department from its inception in 1927 up to a little more than a year ago, when he formed the advertising agency bearing his name, with headquarters at Cleveland.

For over four years Mr. Daily was chairman of the G-E appliance advertising committee. He was also a director of the Association of National Advertisers, and of the Cleveland Advertising Club.

Timken Manager Killed In Auto Accident

WINDSOR, Ont.—Millard J. Roberts, 39 years old, vice president and general manager of the Silent Automatic Division of Timken Detroit Axle Co., was killed in an accident June 15 when his automobile overturned on Cameron Blvd. S., approximately three miles from here.

Police have been unable to determine the cause of the accident.

Mr. Roberts came to Detroit in 1934. He was formerly connected with American Radiator Co. in Buffalo, and was president of the Roberts Gas Burner Co. in that city.

He leaves his wife, Leila L. Roberts; three sons, Arthur, 18, John, 16, and Millard Ray, 11; and his parents, Mr. and Mrs. C. C. Roberts, of Brantford, Ont.

Nye to Head Refrigeration Dept. of Baltimore Store

BALTIMORE—Jack Nye, for the past four years promotion and advertising manager for the Baltimore district of Frigidaire Sales Corp., was recently appointed manager and buyer for the refrigeration, appliance, and radio sections of the Hub department store here.

He succeeds William E. Middleman, who resigned recently. H. M. Barr, at one time supervisor of refrigeration activities at the Hochschild, Kohn & Co. department store, will be the Hub's new supervisor of sales.

Schenectady Celebrates 50th Anniversary of Edison's Arrival

SCHENECTADY — Commemorating the 50th Anniversary of the date on which Thomas A. Edison took title for the shops to house the Edison Machine Works, parent company of the General Electric Co., a two-day civic celebration was held here June 12 and 13.

Highlight of the two-day program was the dinner held here at the Hotel Van Curler June 12. Five hundred guests attended, among whom were pioneers of the Edison organization, G-E executives, and industrial and business leaders from all sections of the country.

Speakers at the dinner were: Owen D. Young, chairman of General Electric Co.'s board of directors; Dr. George R. Lunn, New York state public service commissioner; Charles A. Edison, son of the inventor, and W. S. Barstow, Edison pioneer and president of the Thomas Edison Foundation. Dr. Dixon Ryan Fox, president of Union College, was toastmaster.

A radio broadcast dramatization of a skit depicting Edison's coming to Schenectady from his New York City shops, was broadcast over the NBC Cities Service program, as were two of the dinner speeches.

More than 5,000 persons visited the General Electric Schenectady plant, where open-house was held during the second day of the celebration.

Issued as a part of the June edition, a 24-page Golden Jubilee section, publicizing the celebration, was run in the Schenectady Gazette. In the issue, feature stories, articles, and pictures gave a complete history of the electrical industry's founding, development, and progress, and of its part in the city's growth.

Besides a full-page General Electric advertisement, quarter-page insertions were placed in the Jubilee section by A. Wayne Merriam Co., Inc., Schenectady distributor; Havens Electric Co., Albany distributor; and Radio Sales & Service Co., local G-E dealer.

38,283 Refrigerators Sold In Associated System Contest up to June 10

NEW YORK CITY—Sales of 38,283 mechanical refrigerators up to June 10 represents an average of 86% of the 44,326 unit quota aimed at by the Associated Gas & Electric System in the 1936 Refrigeration Jubilee sales drive which closes June 30. Of this number, 36,307 were electric, 1,976 gas.

A total of 2,944 units were sold from June 1-3, and in the following seven days, 3,364. Covered in the June 10 figure are all sales made by the system and its operating companies from Jan. 1.

Of the 10 properties in the electric division which had passed 100% of their quotas at the last report, Florida Public Service Co. was in the lead with 151.5%, and South Carolina second with 131.6%. In the gas section, Rochester with 152.5%, and K-T-I with 120% were the only two with sales figures above their quotas.

Nine Electrical Leagues Get Nema Certificates

NEW YORK CITY—Nine electrical leagues have already received the Certificate of Approval from the National Electric Manufacturers Association's committee on league financing, and five other leagues made applications for the certificate within a week, Nema officials report.

Leagues to whom certificates have been issued for the current year of operation include: Electric and Radio Association of Kansas City, (Mo.); Electric Association of Chicago; Electrical Association of Rochester; Electrical League of Cleveland; Electrical League of Colorado; Electrical Institute of the Tri-Cities (Rock Island, Ill.); Essex Electrical League (Newark); Electrical League of the Niagara Frontier (Buffalo); and Electric League of Pittsburgh.

Oklahoma Utility Sales Increase 21% in May

OKLAHOMA CITY — May sales among Oklahoma dealers were 21% above those for the same month last year, reports to the Oklahoma Gas and Electric Co. show.

For the first four months of the year, 4,794 sales were reported by the following: Oklahoma City, 1,880; Norman, 98; El Reno, 46; Guthrie, 59; Shawnee, 401; Seminole, 94; Holdenville, 54; Wewoka, 140; Muskogee, 380; Ardmore, 354; Ada, 337; Durant, 68; Pauls Valley, 63; Sulphur, 19; Enid, 363; Alva, 77; Sapulpa, 62; Chandler, 40; Drumright, 99; Bristow, 54; Checotah-Eufaula, 21; Heavener-Poteau, 85.

Now! C.I.T. 6% BUDGET PLAN

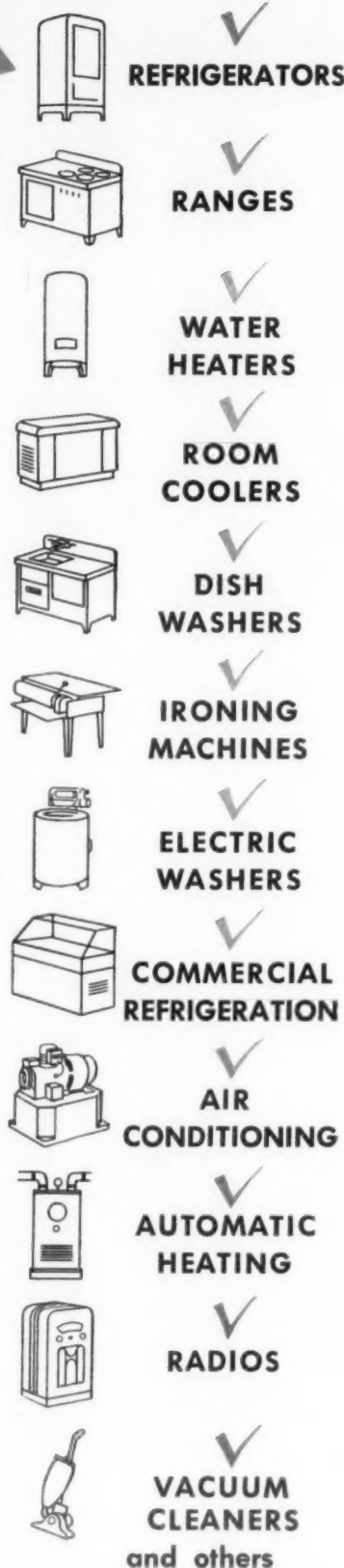
FOR

The new C. I. T. 6% Budget Plan now covers all sales financing needs of household appliance dealers. One plan and one chart serve for all approved products. Furthermore, you can now offer your customers a combination Budget Plan sale of any two or more acceptable appliances in one contract.

This Plan fills the gap left by the withdrawal of FHA. Your prospects who were considering a purchase under FHA will welcome the extension of the C. I. T. 6% Budget Plan to the household appliance field. It will help you close many sales quickly that might otherwise drag on and be lost.

Millions of people have had first-hand experience with C. I. T. in the course of its 28 years of service. Use this confidence to help build up your sales. Feature the C. I. T. Budget Plan as a convenient way to buy.

The new
C. I. T.
6%
BUDGET PLAN
REDUCES TIME
PAYMENT COSTS



Dealers everywhere are using this display sign in their windows and showrooms. Get copies of this sign and of the C. I. T. 6% Budget Plan Chart No. 7165 from the nearest C. I. T. office.

Call the nearest C. I. T. Office today

Abilene - Akron - Albany - Altoona
Amarillo - Asheville - Atlanta - Augusta
Bakersfield - Baltimore - Bangor - Bay Shore
Beaumont - Beckley - Billings - Binghamton
Birmingham - Boise - Boston - Bridgeport
Bronx - Brooklyn - Buffalo - Butte - Camden
Cape Girardeau - Carbondale - Cedar
Rapids - Charleston - Charlotte - Chattanooga
Chicago - Cincinnati - Clarksburg - Cleveland
Columbia - Columbus - Cumberland - Dallas
Dayton - Denver - Des Moines - Detroit
El Paso - Erie - Evansville - Florence
Fort Wayne - Fort Worth - Fresno - Glens Falls
Greensboro - Greenville - Hagerstown
Harrisburg - Hartford - Hempstead - Hickory
Houston - Huntington, W. Va. - Indianapolis
Jacksonville - Jamaica - Jamestown
Jersey City - Johnson City - Kansas City
Knoxville - Lexington - Lincoln - Little Rock
Los Angeles - Louisville - McAllen - Manchester
Memphis - Miami - Milwaukee - Minneapolis
Mobile - Montgomery - Montpelier - Mt. Vernon
Nashville - Newark - Newburgh - New Haven
New Orleans - New York - Norfolk
Oklahoma City - Omaha - Orlando
Paducah - Paterson - Peoria - Perth Amboy
Phoenix - Philadelphia - Pittsburgh
Portland, Me. - Portland, Ore. - Portsmouth
Poughkeepsie - Providence - Raleigh
Reading - Reno - Richmond, Ind.
Richmond, Va. - Roanoke - Rochester
Rome, Ga. - Sacramento - St. Louis - Salisbury
Salt Lake City - San Antonio - San Diego
San Francisco - San Jose - Savannah - Scranton
Seattle - Spartanburg - Spokane - Springfield
Tampa - Toledo - Tucson - Tulsa - Utica
Washington - Watertown - Wheeling
White Plains - Wichita - Wilkes-Barre
Wilson - Yakima - Youngstown - Zanesville

C.I.T.

C. I. T. CORPORATION • NEW YORK • CHICAGO • SAN FRANCISCO
A UNIT OF COMMERCIAL INVESTMENT TRUST CORPORATION
CAPITAL AND SURPLUS MORE THAN \$100,000,000



HELPING DEALERS TO WIDEN THE SCOPE OF THEIR BUSINESS

REFRIGERATION NEWS

Registered U. S. Patent Office

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DETROIT, MICHIGAN, JULY 1, 1936

Copyright, 1936, by
Business News Pub. Co.SPECIFICATIONS ISSUE
25 CENTS PER COPYCommercial Manufacturers Favor
Shorter Financing Terms'Easy Payment' & 'Low Cost
Financing' Plans Attacked
By Association

CHICAGO—Members of Commercial Refrigerator Manufacturers Association took a strong stand against "easy payments" and "low-cost financing" at their annual meeting here June 19 and 20.

Continuation of the principle of small down payments, or none at all, and extension of the credit period to 36 months, permitted under the plans offered by various finance companies, was held to be economically wrong. In the long run, it was held, this practice would rob the industry of the stabilization it has achieved during the depression years.

The following terms and policies were advocated for all deferred sales of commercial refrigerators:

1. Down payments to be not less than 10% cash with order, and 10% on delivery, the balance to be paid in equal monthly installments for a period not to exceed 24 months.

2. All time payment contracts to include a service charge of not less than 6% computed on and added to the cash price, after deducting down and delivery payments and trade-in allowance, if any. Contracts will not bear interest except on delinquent installments.

3. If customer is to be furnished insurance, the specified cost is to be added to the deferred balance, after computing the service charge.

Those participating in the meeting expressed the belief that salesmen and dealers in commercial refrigeration equipment would welcome these terms and conditions, which should result in the establishment of sound trade.

Fedders Field Men
Hear Factory Plans

BUFFALO—The annual mid-year conference of the electric refrigeration and air-conditioning division of Fedders Mfg. Co. was held at the factory here last Thursday, Friday, and Saturday, June 25 to 27.

Thursday's session was devoted to presentation of advertising and sales promotion plans, with discussions led by H. E. Rieckelmann, vice president, W. D. Keefe, sales manager, and Horace Laney, head of the company's advertising agency.

Friday's sessions, covering engineering and sales, featured speeches by L. C. Smith, executive engineer, and Joe Askin, chief engineer. Inspection trips were made to the recently enlarged engineering department and experimental laboratory, as well as the new 11,000-ft. addition to the Fedders factory for increased production.

(Concluded on Page 2, Column 4)

Air Conditioning to
Be Clarified in
Advertising

WASHINGTON, D. C.—In an effort to clarify the meaning of "air conditioning" and the function which it may be expected to perform in summer, winter, and year-round use, Air Conditioning Manufacturers' Association and Kinetic Chemicals, Inc. are jointly sponsoring a series of advertisements in business, professional, and general publications.

For the protection of their investment and for their personal satisfaction, prospective buyers of air-conditioning equipment are urged, in the advertisements, to insist that the systems they buy perform the functions of true air conditioning—cooling, dehumidification, and circulation in summer, and heating, humidification, and circulation in winter.

Business publications to be used in the drive include, besides ELECTRIC REFRIGERATION NEWS, the following: *Ice and Refrigeration*, *Refrigerating Engineering*, and *Heating, Piping & Air Conditioning*.

General magazines include *Time*, *Chain Store Age*, *American Restaurant*, *Retailing*, *Architectural Forum*, *Federal Architect*, *Building and Building Management*, and *Building Modernization*.

Advertisements in refrigeration publications will be run during July and August; the series in the general magazines will be spread over a period from June 29 to December.

Nema Sub-Committees
On Advertising Named

DETROIT—Memberships of the Nema Commercial Refrigeration Section's trade practices sub-committees on sales, advertising, and service and codes were announced last week by P. Y. Danley of Westinghouse Electric & Mfg. Co., chairman of the main committee.

With Mr. Danley, W. E. Landmesser of General Electric Co. and R. E. Smithson of Frigidaire Corp., the two other members of the main committee, are chairmen of the three sub-committees.

Subcommittee on sales is composed of Mr. Danley, chairman; W. C. Rowles, Norge Corp., and C. A. Pearson, York Ice Machinery Corp. On the sub-committee on advertising, in addition to Chairman Landmesser, is John C. Garceau, of Kelvinator Corp. Service and codes sub-committee includes, besides Mr. Smithson, J. H. Holton of Carrier Engineering Corp., and H. L. Morrison of Universal Cooler Corp.

Next meeting of the group has been scheduled for Aug. 7, at Mansfield.

Sales of Household
& Commercial Units
Hit New Highs

DETROIT—Continuing the record-breaking pace established in April, May sales of household electric refrigerators by manufacturers to distributor and dealer outlets shot upward to 344,200 units, according to estimates by ELECTRIC REFRIGERATION NEWS.

The May world sales total is 22,900 units above the 321,300 total for April, when a new all-time monthly high for the industry was established.

This marks the third successive month in which new sales records have been written into the household refrigeration industry's history, for the March total, 285,900 units, was also a new high mark for the household field. April's total beat that mark by almost 35,000 units, and May's sales by more than 58,000.

Sales by 15 member companies of the Household Section of the Refrigeration Division of National Electrical Manufacturers Association during May were 320,130 units, only 1,270 under the all-industry total for April. United States sales totaled 299,518 units, far above figures for any previous month. Sales in Canada totaled 5,304, and in other countries 15,315 units.

Commercial refrigeration and air-conditioning equipment sales during May also soared to a new all-time high, the total being 35,613 units, reported by 15 Nema member companies. Previous high for the industry was established in April, when 27,299

(Concluded on Page 2, Column 1)

Ranco Builds Line of
Commercial Controls

COLUMBUS—Automatic Reclosing Circuit Breaker Co., manufacturer of Ranco controls for household electric refrigerators, has entered the commercial refrigeration field with a complete line of controls for commercial installations, it was announced last week by E. C. Raney, vice president and general manager of the company.

The new units are now in production in the company's new Fifth Avenue plant here.

Plans for producing a line of commercial controls have been under way for some time, Mr. Raney said. Definite marketing plans, however, could not be formulated until additional production facilities had been obtained. With the completion of the new plant, the production path was cleared, and field and laboratory tests of the new units have been conducted extensively during the past few months.

Ease of application, accessibility, simplicity of construction, strength, and reliability are among the features

(Concluded on Page 2, Column 4)

Stork Manages Crosley
Service Department

CINCINNATI—Lester C. Stork has been appointed manager of Crosley Radio Corp.'s service department. All departments having to do with local and national radio and refrigeration service and parts will be coordinated under his supervision.

Mr. Stork has been with Crosley Radio Corp. for three years. For half of this period he was in the factory production department doing radio engineering work; for the following 18 months he was in the refrigerator manufacturing division supervising production.

Riggin Elected President of
Mueller Brass Co.

PORT HURON, Mich.—Fred L. Riggin, former executive vice president of Mueller Brass Co., has been named president of the company to succeed Oscar B. Mueller, who is relinquishing his active association with the organization.

Mr. Mueller, it was announced, will retire also from the board of directors. Other new officers of Mueller Brass, in addition to Mr. Riggin, are Max Edmondson, secretary, and Miss Zelda Dunkel, assistant secretary.

Furniture & Dept. Stores Ask
Revisions of Warranty PlansConsumers Misled by
Advertising, Say
Furniture Men

CHICAGO—Asserting that the advertising and promotion back of various "protection plans" and "term guarantees" now in effect tends to mislead the consumer and place an undue responsibility on the individual dealer, the appliance merchandising committee of National Retail Furniture Association, in a letter made public last week, asks manufacturers of electric refrigerators to consider these conditions in planning their 1937 merchandising programs.

A second letter, to be sent this week, will suggest that service guarantees on refrigerators be confined to one year, and that the phraseology be such as to be easily understandable to both dealer and customer.

Other conclusions of the committee, reached after a survey of retail attitudes and the details of warranty and "protection plan" offers, are that their effect has been to force time payments beyond sound limits, and throw an added burden of service upon the retailer, for which he gets no compensation either from the consumer or the manufacturer.

Complete text of the letter follows: "Since the announcements earlier this year of the various kinds of 'protection' (Concluded on Page 2, Column 4)

New Kellogg Compressor
For Top-Mounted Units

ROCHESTER, N. Y.—Kellogg Compressor & Mfg. Co. has just announced a new small compact direct-drive compressor of the open type, adaptable for installation in refrigerators of the top mounted type with available height as low as 8 1/2 inches.

Construction of the unit is identical with that of Kellogg's direct-drive compressor, announced earlier this year, except that the cylinder is set at an angle of 45°, and the height of the unit has been cut down as much as possible by means of an underslung platform.

A.S.R.E. Fails to Take Expected Action on
Air Conditioning Applications Code and
Standards for Rating Household Units

By Phil B. Redeker

SKYTOP, Pa.—With a near-record registration for a spring meeting, the American Society of Refrigerating Engineers met June 22-24 here to consider new data presented in papers in technical problems, and to contemplate action on engineering standards and rating methods.

Two steps which the A.S.R.E. had been expected to take at the sessions failed to materialize—the appointment of the society's part of a joint A.S.R.E.-A.S.H.V.E. committee to formulate an air-conditioning applications code; and the final approval of a rating method for household electric refrigerators, similar to the one approved for commercial machines.

However, the society was said to have given consideration to the appointment of a committee on air-conditioning applications code, and that some action is contemplated at a future date.

According to Glenn Muffy, general chairman of the Joint Committee for Rating and Testing Mechanical Conditioning Units, some minor changes were made in the standards adopted last November, and other suggestions were given consideration.

"We have been asked to qualify the equipment that is to be rated—to provide for the possibility of the use of special motors, heat interchanger equipment, etc.," said Mr. Muffy.

"We do not feel that this is within the scope of the purpose of the rating standards. We have set up a method of rating a particular piece of equipment, and if that piece of equipment

NEW YORK CITY—Revision of the five-year guarantee now in common use in the sale of electric refrigerators, curbing of illegitimate and unethical appliance dealers, exorbitant allowances on trade-ins, and other merchandising problems were the central topics of discussion at a meeting of department store major appliance merchandisers and buyers at Hotel Pennsylvania last Wednesday.

Edward List of Abraham & Straus, Inc., Brooklyn, was elected chairman of the group, which, it is expected, will become affiliated as an organized body with the proposed housewares group of the merchandising division of National Retail Dry Goods Association.

At the meeting, presided over by A. H. Denburg of Kresge's Department Store, Newark, it was emphasized that the five-year warranty on refrigerators now in effect is frequently misleading to the customer. An unqualified guarantee of two years, covering all repairs and replacements, was agreed on as being more desirable.

Members of the group also expressed the opinion that manufacturer cooperation should be sought to bring down repair costs on hermetically-sealed refrigerator units, and the guarantee eliminated from customer advertising.

Because appliance departments have been operating at a loss in the average department store, the group also decided to invite a special committee of the N. R. D. G. A. Controller's Congress to study, with a committee of its own, the merchandising and operating expenses involved in handling refrigeration and appliances.

The same committee will consider a plan for enlisting the aid of manufacturers and distributors in the study, to remove any unethical merchandising practices now prevalent in the business. The aid of manufacturers and distributors will be sought by the committee in the solution of all these questions.

The group plans to meet again on July 21, during the National Housewares Show at Hotel Pennsylvania.

Announcement—

AIR CONDITIONING
SPECIFICATIONS

July 29, 1936

The supply of extra copies of the May 20 issue, containing air-conditioning specifications, has been sold out.

The complete tabulation will be reprinted (with corrections) in the July 29 issue. Please send orders for extra copies in advance, with remittance. Price 25¢ per copy.

In addition to data on self-contained room coolers and air-conditioning systems which provide the cooling function, the July 29 issue will have listings of heating systems which provide humidification and forced air circulation.

Manufacturers of summer, winter, and all-season air-conditioning systems are invited to furnish complete details regarding their products for publication (no charge) in this issue. Questionnaire forms will be furnished on request to any manufacturer who is not already on our mailing list.

HOUSEHOLD REFRIGERATOR SPECIFICATIONS

ALL MAKES—ALL MODELS
Are Tabulated in This Issue

Sales of Household & Commercial Units Set May Record

(Concluded from Page 1, Column 3) units were sold to beat the record set only a month before by March sales of 21,346 units.

May's commercial sales total bests the April all-time high by 7,314 units. Responsible in large part for the increase was the jump in sales shown by air conditioners, ice cream cabinets, pressure water coolers, and bottled beverage coolers.

Self-contained air conditioner sales jumped from 115 in April to 1,519 in May; floor type conditioners from 340 to 417; ceiling type conditioners from 299 to 409. Bottle water cooler sales increased from 655 in April to 1,063 in May; pressure water coolers from 1,644 to 2,428; ice cream cabinet sales from 4,658 to 6,080; and bottled beverage cooler sales from 4,920 to 6,660.

Reporting to Nema's Household Refrigeration Section for the month were Apex, Crosley, Fairbanks-Morse, Frigidaire, General Electric, Gibson, Kelvinator, Leonard, Norge, Servel (export only), Stewart-Warner, Sunbeam, Uniflow, Universal Cooler, and Westinghouse.

Not reporting were Jomoco, Inc., Merchant & Evans, and Sparks-Withington. Sales include units manufactured by Nema member companies for Major Appliance Corp., Montgomery-Ward, Potter, and Sears-Roebuck.

Commercial refrigeration and air-conditioning manufacturers reporting to Nema's Commercial Refrigeration Section for May included Brunner, Carrier, Crosley, Frigidaire, General Electric, Gibson, Kelvinator, Leonard, Merchant & Evans, Norge, Servel, Universal Cooler, Uniflow, Westinghouse, and York.

Easy Payment Plan on Commercial Sales Is Attacked

(Concluded from Page 1, Column 1) practices that will prove beneficial to all.

Good merchants, it was pointed out, are more interested in securing equipment that will make money for them than in buying terms and price. The sale of commercial refrigerators at more liberal terms than experience has shown to be required gives the poor merchant an advantage that will penalize the efficient operator.

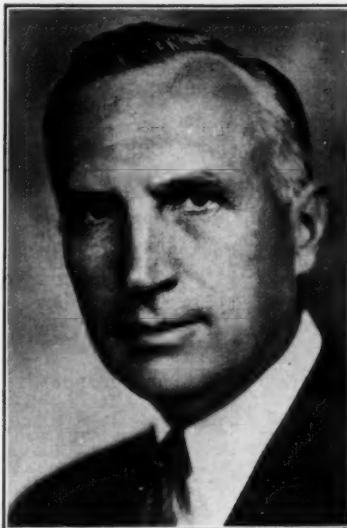
Executives of nearly all the major manufacturers in the field reviewed the progress of the industry during the past year, giving particular attention to the results of the FHA program and the recent activities of finance companies in advocating more liberal selling terms.

It was the opinion of these executives that (as pointed out in a recent editorial in *ELECTRIC REFRIGERATION NEWS*) the discontinuance of loans for financing portable goods on contracts less than \$2,000 was a blessing in disguise. A very small proportion of the expansion in volume enjoyed by the industry during the year, it was shown, could be traced to the promised stimulus of FHA financing.

On the other hand, those manufacturers who had adhered to their former terms and policies had secured a greater share of the increase than those who had adopted the FHA setup.

The following were elected officers: W. T. Sherer, Sherer-Gillett Co., president; E. E. McCray, McCray Refrigerator Sales Corp., vice president; W. B. McMillan, Hussmann-Ligonier Co., treasurer; and J. I. Holcomb, Holcomb & Hoke Mfg. Co., and E. L. Stultz, Viking Refrigerators, Inc., directors.

Mueller President



Fred L. Riggan, who succeeds Oscar B. Mueller as president of Mueller Brass Co., Port Huron, Mich. A former sales manager and executive vice president, he has been with the company for 32 years in Decatur, Ill., Sarnia, Ont., and Port Huron.

Walker Supply Co. Opens Terre Haute Branch

INDIANAPOLIS—The Walker Electric Supply Co., Inc., distributor of Westinghouse commercial refrigeration equipment in Terre Haute, Ind., recently opened a branch office here, with Norman E. Wooters in charge.

NRFA Says Protection Plans Are Confusing To Purchasers

(Concluded from Page 1, Column 4) plans' and of several varieties of 'term guarantees,' the National Retail Furniture Association has been receiving letters of inquiry and of protest from its members.

"In view of this, the Association's appliance merchandising committee ordered a further survey of retail attitudes, also a study of the producers of electrical refrigeration.

"As a result of this study, the following conclusions have been drawn. We present them to you for your earnest consideration with hopes that as plans are being made up for the 1937 refrigeration merchandising and promotions, due consideration will be given them.

"1. While the 'standard warranty' of one year on all parts is not without merit, the way in which this warranty is coupled up with advertising to the consumer on 'protection plans' running from five to ten years, misleads the consumer.

"2. Not only is the consumer misled as to the details of the protection coverage for a term period; she presses the retailer for a pay plan that will cover the life of the warranty. In other words, the effect of the warranty has been to force extension of the time payment stretch, beyond sound time payment limits.

"3. The technical verbiage on some of the warranty certificates has the effect of throwing an added burden of service upon the retailer for which he gets no compensation, either from the consumer or from the manufacturer who flouts the warranty. If the consumer buys a refrigerator from an established retailer from whom she and her family have been making purchases over a period of years, that consumer looks to the established retailer, not to the manufacturer, for service. And regardless of cost of satisfaction, the merchant must live up to his promise.

"4. The number of manufacturers of refrigerators is on the increase. The greater the number of brands offered for sale the more uncertain is the consumer that the manufacturer will be in position throughout the life of the warranty to fulfill its terms, thus leaving the established merchant with the other alternative to make good on his own responsibility.

"The appliance merchandising committee of this Association earnestly recommends the above for your consideration. Comments to this office will be forwarded to members of the committee."

Ranco Markets Line of Commercial Units

(Concluded from Page 1, Column 3) claimed for the new controls, which are made with an all-steel, dust-tight case, with all parts plated for corrosion resistance.

Removable snap-locking side covers afford easy accessibility. Controls, it is said, need not be level; they are claimed to operate satisfactorily in any position.

All pressure power elements are attached to the control by means of rotating fittings. Power elements and connections may be turned to any desired position.

A wide range of operation is also claimed for the new Ranco units. They are adjustable for use with methyl chloride, sulphur dioxide, or Freon, without any change of parts.

In the new combination pressure control, a low pressure control and a high pressure cut-out are contained in one case. Both controls have common connections, conveniently located and spaced. All adjustments are the same for the combination as for each individual switch.

A new bulletin, describing the Ranco line of commercial controls, has been prepared by the company and is ready for distribution.

Fedders Branch Managers See Plant Addition

(Concluded from Page 1, Column 1) of valves, unit coolers, unit heaters, and water coolers.

The space formerly occupied by these departments has been taken over for production of finned coils for commercial refrigeration and air conditioning.

Saturday was devoted to entertainment, including an outing of 1,100 Fedders employees at Coconut Grove.

Branch managers and field representatives in attendance at the conference included Franklin G. Slagel, Los Angeles; Marc A. Shantz, Chicago; Frank A. Haag, New York City; Herbert C. Hoover, Philadelphia; Leo J. Freitas, Dallas; R. L. Chambers, Denver; Henry Sherman, Cincinnati; Carlton E. Ohlheimer, Atlanta; Norman C. Honecker, Boston, and Charles P. Rittling, Buffalo.

Kelvinator Names 19 New Commercial Distributors

DETROIT—Nineteen new distributors of Kelvinator commercial refrigeration and air-conditioning equipment have been appointed during the last month.

Under Kelvinator's "split franchise" plan the new distributorships were divided as follows:

Standard commercial, three; beverage coolers, one; liquid cooling and air conditioning, two; standard commercial and liquid cooling, one; standard commercial, liquid cooling, and air conditioning, one; air conditioning, two; complete commercial line, three; automatic heating, one; air conditioning and automatic heating, two; and for liquid cooling three.

The new distributors are:

Ball Store Fixture Co., Dayton, O. S. Ball, president; Lang Appliance Corp., Toledo, S. H. Federman, president; Oil Heating Devices, Inc., Cleveland, R. G. Niernann, president; Car-Pet-Line Stores, Inc., Rockford, Ill., L. E. Carlstrom, president; Neff Refrigeration Co., Springfield, Mass.; Bates Brothers Electric Co., Westfield, N. Y. B. H. Bates, president; Schwegler Brothers, Inc., Buffalo, A. F. Schwegler, president; Allison & Burri, Freeport, N. Y., W. F. Allison, partner; Refrigeration Specialty Co., New York City, Ralph Atkinson, owner; Metcalf Brothers, Inc., Rockville Center, L. I.

May-tag Big Spring Co., Big Spring, Tex., Frank Spaulding, owner; Henry's Confectionery, Hugo, Okla., W. C. Henry, owner; Laugher Furniture Co., Beeville, Tex., B. P. Laugher, partner; Radio Service Laboratories, Corpus Christi, Tex., Holland Henderson, owner; Albert G. Purdue, New Haven, Conn., Albert G. Purdue, owner; Model Heating Co., Cincinnati, Rudolph Schneller, executive; Gamp Electric Co., St. Louis, Leo H. Gamp; Blodgett Supply Co., Inc., Burlington, Vt., John H. Patrick, executive; Pittsburgh Refrigeration Co., Pittsburgh, J. W. Klein, president.

New Group Handling G-E Sales in Conn.

WATERBURY, Conn.—Management of Modern Home Utilities, Inc., General Electric distributor for the state of Connecticut, has been taken over by a new group, headed by Orrin P. Kilbourn of West Sunbury, Conn.

The distributorship, founded in 1927, has retail stores in Waterbury, New Haven, New London, and Middletown, and dealer representatives in other cities throughout the state.

Mr. Kilbourn, president, has had 22 years experience in automotive and advertising fields. Joining the Willys-Overland automotive company after his graduation from Yale in 1914, Mr. Kilbourn later became assistant general sales manager, a position which he held until 1928.

He then joined the J. Walter Thompson Co., advertising agency, leaving in 1930 to become New York City distributor for DeSoto cars. Two years later he became a partner in the J. Stirling Getchell, Inc., advertising agency for the DeSoto motor car, for which firm he was Detroit resident partner until last year.

J. E. Nelly of Waterbury, formerly general manager of Modern Home Utilities, Inc., is now its vice president, and R. Barry Greene is secretary-treasurer.

Mr. Greene is a graduate of Harvard, and the Harvard School of Business. He comes to Modern Home Utilities, Inc. from an executive position with Montgomery-Ward.

Frigidaire Line Taken on By European Radio Co.

NEW YORK CITY—European Radio Co., operator of a chain of four radio and appliance stores in Manhattan and Brooklyn, has taken over the appliance dealership at 282 Livingston St., Brooklyn, under lease from Frigidaire, it was reported last week.

Under the lease, it is said, European Radio Co. will be permitted to display only Frigidaire refrigerators, although other makes may also be handled. At present the company is operating three stores in Manhattan and two in Brooklyn.

Louis Titefsky is president of the organization, which began business in 1915 as a radio and phonograph dealer.

Ernest Meserve, former major appliance buyer for Wanamaker's department store, New York City, who had been operating an appliance dealership in the Livingston St. store, has opened another at 12 Lafayette St. Associated with him is Harold Lloyd, former Wanamaker radio buyer.

Leo Roberts, sales manager of the store under Frigidaire and Meserve dealerships, has remained to direct sales for European Radio Co. His sales organization numbers 14 men.



**"Madam, You're Getting the MOST for Your Money
—It's BALSAM-WOOL Insulated!"**

Every good salesman knows that it's easier to sell a prospect merchandise that he already knows something good about.

BALSAM-WOOL Fiber Slab Insulation is an excellent "talking point" in selling a refrigerator, because Balsam-Wool has already proved that it does everything an insulation should do in countless thousands of homes. Just as Balsam-Wool gives maximum protection against heat and cold as house insulation, so it guards the owner's investment in a refrigerator.

That is one of the reasons why Balsam-Wool insulation is used to insulate more refrigerator cabinets than any other material.

Tell customers about the insulation in the refrigerators you sell. They'll be glad to know that America's leading home insulation is giving them more for their money in the refrigerator they buy.

WOOD CONVERSION COMPANY
Room 138, First National Bank Bldg., St. Paul, Minn. • New York, N. Y. • Chicago, Illinois

BALSAM-WOOL
FIBER SLABS
PRODUCT OF WEYERHAEUSER



"Nothing Short of Perfect!"

They call the Mills Compressor "Nothing short of perfect!" Just one example of its perfection is the design of the seal assembly. This important part, by benefit of its new design, at last has been made of the most suitable materials for its functioning. *Entire seal assembly or any part of it can be removed and replaced without disassembling

the compressor. Every other angle of compressor design has been given the same modern touch by Mills engineers in creating the Mills Compressor. Our line includes compressors of every standard capacity from ¼ h. p. to 7½ h. p. New comprehensive catalog sent free.

MILLS NOVELTY COMPANY

4100 Fullerton Avenue

Chicago, Illinois

Utica Dealers Find Intensive Sales Training Profitable; Trade-ins a Problem

By Phil B. Redeker and Eleanor Blum

Last week staff members of **ELECTRIC REFRIGERATION NEWS**, returning from the convention of the American Society of Refrigerating Engineers in Skytop, Pa., stopped off at Utica and Buffalo to interview electric refrigerator dealers and distributors for the purpose of getting a picture of the status of sales progress, selling methods, and merchandising problems in those communities, thus continuing the series of staff written field reports which have been featured in the News this year.

The report on this page covers Utica only. The story on Buffalo will probably appear in next week's issue.

Schwenders Earns Title of 'Cleanest Competitor'

Referred to by other store managers as the "best merchandiser and cleanest competitor in town," Schwenders, Inc., dealer for G-E and Potter refrigerators, justifies its reputation with a sales plan based on a reputation for quality merchandise and service, which nets sales of approximately 250 to 300 units a year.

Albert Inkwich, manager of the refrigeration and appliance department, called business "spotty" but better than last year. He spoke of the wholesale competition Utica dealers find so troublesome but said that it "isn't serious."

Utica customers, Mr. Inkwich said, "have to be sold" so that department stores, which usually confine themselves to taking orders, aren't a serious factor in refrigeration competition. But the public is shopping a lot and doesn't accept any story at its face value, he stated.

Spot broadcasts, local newspaper advertising, and occasionally sponsored programs from the local station keep Schwenders in the public mind.

Although of his six salesmen, the youngest in point of service has been with him three years, Mr. Inkwich still thinks it necessary to have regular daily sales meetings. At each of these morning meetings, one salesman is required to give a complete merchandise demonstration, thus insuring that the "salesmen know first of all what they are selling," he says.

In addition to this "Get Acquainted With Your Merchandise" method, other sales training includes the La Salle Institute course in 10 volumes,

covering each electrical appliance. After studying each of these volumes, the salesmen are required to take an examination.

A wide-awake organization, and the desire to sell quality and service are fundamentals of selling in Mr. Inkwich's opinion. All 21 employees of the store, truckmen, office workers, and servicemen, are all on their toes for possible leads, he says.

Schwenders has built its reputation on service and maintains that reputation with a staff of six servicemen who do no servicing outside the products sold by the company itself.

Concrete evidence of this policy, Mr. Inkwich stated, comes to the customer through the company's system of check-backs. Of the six salesmen, only one is on floor at a time. The rest, according to Mr. Inkwich, are kept busy checking-back and following outside leads.

After each sale, the salesman must go to the customer and get his signature that the appliance has been checked to his satisfaction. With this signature, a file is made, and part commission paid; final payment coming to the salesman after he has made the second check-back. This service has been in effect for six or seven years, Mr. Inkwich says, and some of the old customers still remember getting as many as three check-backs on their purchases in a year.

A section for the washer, radio, cleaner, stove, and gas range, Hi-Lo burner advantage, oil burner, refrigerator, and ironer, with individual parts to be checked under each item is included on this card, together with a place for the appliances already owned, the names of the neighbors on the left and right, the next item wanted, the one stressed by the salesman, and the purchaser's signature.

Goodman Uses Walls for 'Proof' Selling Promotion

Goodman Home Furnishers, Inc. gives its most prominent floor space facing the door to its display of Frigidaire household electric refrigerators and follows that advantage with a complete display of "proof" promotion material around the walls of the store.

Although Harold H. Goodman, part owner and manager agreed that business is better this year than last, he complained of unfair competition from

a distributor-dealer set-up, which, he said, allowed one town company to use its difference in discounts to an unfair advantage.

Discounts as high as 20% for police or any state employee, and for anyone working for a large corporation have been granted by this firm, Mr. Goodman claims.

Goodman's follows no definite plan for prospect-getting, and sends its six salesmen out of the store only to follow definite leads. Floor traffic obtained through newspaper advertising is the source of almost all the prospects.

Mr. Goodman trains his salesmen in general home furnishing technique rather than as special refrigerator salesmen. He gives them a regular sales course, and meets with them for a short regular meeting once a month. The Onondaga Auto Supply Co., Frigidaire distributor, also offers a regular sales course which his salesmen take, he said. His staff is paid on straight salary basis.

A limit of \$5 for a wood ice refrigerator traded in, and \$10 for metal ones has solved the problem of allowances, Mr. Goodman says. Unless a definite limit of such a type is set, he believes that unfair allowances that are hard to keep up are established to the store's ultimate loss.

The Home Furnishing Store's "Charm House," Mr. Goodman admits, should have a model kitchen, but as yet the store has done little with the kitchen planning idea.

Roberts' Hardware Co. Concentrates on Ranges

Roberts' Hardware Co., Inc., claiming to make 75% of the town's range sales, prefers to concentrate on this field where there is more profit and less "chiseling" than in the refrigerator business, asserted Russell Wehnau, salesman.

R. P. Heald is the manager of this year-old appliance department of the 80-year old hardware firm. A Kelvinator in the window with the radio display and other display by the door are used for "eye catchers" to carry the customers to the extreme end of the store where the appliance department is situated.

Six general appliance salesmen rotate on floor duty so that each has a day on the floor and the rest of the week outside. Canvassing for refrigerator sales, Mr. Wehnau says, is not very profitable, however.

Local newspaper advertising on refrigerators brings only an average of one and-a-half persons a day into the department, 80% of which are sold, either at the time or later, Mr. Wehnau declares.

A very small percentage of prospects, he maintains, is obtained from the Kelvinator bond coupons which offer the customer \$5 for the name of any prospect who later buys.

Indicative of a high salesman turnover, Mr. Wehnau pointed out, is the fact that of the eight salesmen who took a sales training course from Harold Sandwick of Graybar Distributing Co. in February, only one is left on the staff. The manufacturer's motion picture series is the sales training used for the most part by Roberts'.

Kelvinator's "meter system," Mr. Wehnau says, makes for clean price selling, a thing badly needed in the refrigeration industry in his opinion. He joined the cry against the one dealer-distributor set-up in town, saying that the firm boosted the list price, then allowed as high as a 40% reduction from that new price, still selling a great deal below the list price.

In ranges, however, he insists that it is still possible to make a good legitimate profit on a large volume.

One man, acting as combination sales and service man, does all the appliance servicing at Roberts'.

Dept. Store Makes Most of Its Sales to Regular Trade

As the only department store in Utica selling refrigerators, J. B. Wells and Sons, Inc. gets most of its business from regular customers which, according to E. B. Kuhl, manager of the appliance department, isn't surprising when you know that the store has been established for 90 years.

In spite of the apparent advantage of an established clientele, Mr. Kuhl finds that most Utica people go to an electric appliance store for their refrigerators. This year, however, all sales have been slowed down by inclement weather, he asserted.

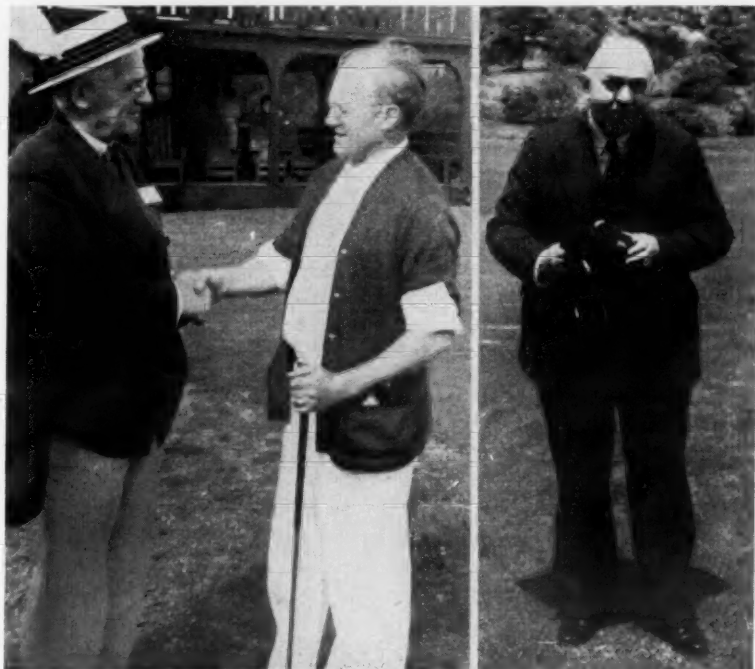
With only one salesman in addition to himself, Mr. Kuhl finds training of any sort unnecessary. He follows up his own leads which he obtains exclusively from floor traffic.

With no outside staff, he maintains, he can keep the store's policy of carefully explaining guarantees and other factors which are misleading to the average customer, whereas outside salesmen, working on commission, are hard to control.

"Too much grief" is his verdict of the appliance field which he finds is full of customers' complaints and competitors' unfairness.

He echoed the complaint heard all

Old Timers at A.S.R.E. Meeting



Left: Consulting Engineer E. T. Williams wishes D. P. Heath of McCord Radiator & Mfg. Co. the best of luck as the latter starts on a round of the Skytop course. Right: Turn about is fair play. Cameraddict Harry Edwards of Union Carbide & Carbon Co., caught at his own game.

over Utica that competitors sell at wholesale prices making price meeting impossible for other stores. A dealer association he thought might be helpful, but said that most such groups fall through or else the ethics they establish fall once the men are out in the selling field.

He named Kempf's, selling Westinghouse, as the strongest dealer in town, and as the next strongest sellers, Frigidaire and Kelvinator.

Wells includes its refrigeration advertising in the regular store ads, and its displays in the furniture and appliance division.

Kempf Holds Weekly Night Meetings for Sales Training

Kempf Bros., Westinghouse dealer-distributor in Utica, has already reached the year's quota and is 30% ahead of last year's sales with what Leo M. Rayhill, manager, calls the "best part of the year" still ahead.

The company's eight retail salesmen move approximately 350 boxes locally a year, Mr. Rayhill says, but at present they are faced with a problem of having no refrigerators in stock.

Weekly night meetings and constant supervision of salesmen are used, Mr. Rayhill states, to keep the salesmen trained to tell a complete story.

Every man has two sales stories, a long one, and a short four or five minute one. Whether the customer has the time to spare immediately or not, one of these stories must be completed, the manager maintains, or else the sale is lost to a price competitor.

Even an unsolicited order received from a town customer through the mail must be followed up and the sales story given just as though it were a competitive sale, he insists.

Mr. Rayhill joined with the other refrigeration dealers in town, who, without exception, complained of price cutting by wholesale concerns and manufacturers' representatives. One manufacturer, he said, went so far as to sell direct from the factory at retail. Misrepresentation is another factor named by him as hard to combat.

The answer to the mail-order house selling question, which also must be met in the near future, Mr. Rayhill believes, lies in the manufacturers staying together. Without some co-operation, he said, the mail order house will come in and take the profits while manufacturers of the standard makes tear each other apart competitively.

He compared the situation in the refrigeration industry to the piano business, in which, he says, there used to be a distinction between legitimate and "stencil" labels. A "stencil make" in the piano industry, he explained, was one on which there was no reference to the actual maker of the product. The trade knew such a make as a cheap and unreliable product.

Similarly, stencil makes of refrigerators, he said, occupy a place in the refrigeration industry, but not a serious place—unless the other manufacturers choose to make it so by tearing each other apart.

In selling, Mr. Rayhill insists that there is no substitute for house business. "A strong house with a strong franchise is hard to beat." As a piano and phonograph dealer, Kempf Bros. has built up a large store traffic, and now has as many as 4,000 open accounts, he stated.

He is not satisfied with store traffic alone, however, and requires that all his salesmen do a certain amount of cold canvassing, not only because of

the sales possibilities but because he believes that canvassing is the way a good salesman knows what his competitor is doing.

As a distributor and dealer, Kempf's allows no other Westinghouse dealer in Utica, and maintains the two departments, wholesale and retail, separately, Mr. Rayhill stated. Each of the dealers out of the city also has a closed territory in which other Westinghouse dealers are not allowed to compete even at the risk of losing a sale to a competitor.

Rigid dealership and territorial protection is necessary to keep satisfied dealers, the manager averred. He does not, however, believe in exclusive territories for salesmen.

Having had the Westinghouse franchise since that company made its first refrigerator, Kempf's feels that it has no sore spots in its territory, and that a long record with one company precludes any criticism.

Longway Wishes Utility Would Re-Enter Merchandise Field

Some of the leading Utica dealers, we were somewhat startled to find, expressed a wish that the local utility was back into active merchandising of refrigerators. M. J. Longway of the H. D. Morehouse & Son Co. put it this way:

"When Utica Gas & Electric was selling refrigerators, they kept the dealers in line on prices and ethical selling practices. But the dealers weren't satisfied with the situation—they 'crabbed' about the utility competing with them until the electric company finally dropped the sale of electric refrigerators."

"As soon as that happened, a bunch of merchants who hadn't been handling refrigerators before thought they saw a big opportunity—and these dealers are the ones who have disturbed the good sales practices."

Sales increases were recorded in both the household and commercial lines, said the Morehouse representative, but competitive conditions, chiefly in the matter of trade-ins, had tended to cut profits.

"You can't sell a thing without taking something in trade," said Mr. Longway. "The automobile industry has made people 'trade-in conscious' so that they shop around until they find a dealer who gives an allowance which cuts all the profit out of the sale."

According to Mr. Longway, Utica dealers can't seem to agree on any cooperative activity that would tend to clean up local merchandising practices."

Utility Gives Showroom to Dealers for Display

Utica Gas & Electric, while not selling electric refrigerators, helps the dealers in many ways.

Facilities of the company's spacious showroom is offered to dealers, and a rather complete lineup of refrigerators was on the floor when we visited the showroom.

Salesmen for the utility (other types of appliances are sold) offer interested prospects information about the refrigerators, and if the prospect is interested enough to give his name, the salesman takes it and passes it on to the dealer to follow up.

In the Spring of the year the utility sponsors a refrigeration show, in which special inducements are offered to get the public to attend.

During the selling season, refrigerators are given space in the utility's advertising.



COPELAND
Commercial Refrigeration

Precision-Built TO GIVE YOU TROUBLE-FREE Performance

YOU are selling long-time performance when your customers select Copeland Commercial Units. The many years of dependable operation which we build into Copeland Units, are your assurance that you are building solidly for the future. Copeland distributors, everywhere, appreciate the value of developing and holding customer good-will and know from experience that profits made by selling Copeland, are permanent profits. A few territories are available for this valuable Copeland franchise. Write today!

COPELAND REFRIGERATION CORPORATION
Manufacturers of a complete line of Household and Commercial Refrigeration
Holden Ave. at Lincoln . . . DETROIT, MICH.

Copeland
DEPENDABLE Electric REFRIGERATION

FOR THE GREATEST RADIO SEASON IN HISTORY



CROSLEY MODEL 250

Five Glass Tubes, Two Bands . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Tone Control . . . Triple-Twin Output Tube. Cabinet front panel is of stump walnut veneer, 13 1/4" high, 11 1/4" wide, 7 3/8" deep. **\$25.00**

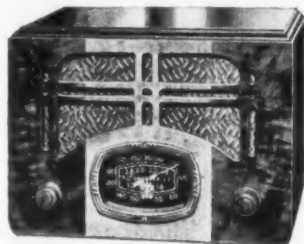
CROSLEY FIVER

Five Glass Tubes, Two Bands . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Tone Control . . . Triple-Twin Output Tube. The cabinet front panel is of walnut veneer. 11 1/2" high, 11" wide, 7 1/2" deep. **\$19.99**



CROSLEY MODEL 251

Five Glass Tubes, Two Bands . . . A. C.-D. C. . . . Attached Antenna . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Front panel of stump walnut veneer, 7 3/4" high, 10 3/4" wide, 5 3/8" deep. **\$25.00**
Also available with metal tubes at \$26.25



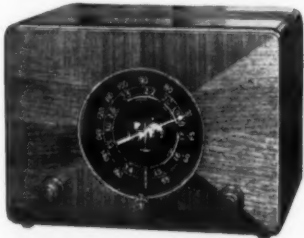
CROSLEY MODEL 295

Features and tubes same as Crosley Fiver. This beautiful cabinet has striped walnut veneer on front panel and also on one end panel. Other end panel is decorated with flutings. 10 5/8" high, 16 1/2" wide, **\$29.95**
7 3/4" deep.



CROSLEY MODEL 299

Features and tubes same as Crosley Model 251. A. C.-D. C. Cabinet front panel is of diamond matched pin stripe walnut veneer. Pin stripe walnut veneer on back of cabinet. 8 1/4" high, 11 5/8" wide, 5 3/4" deep. **\$29.95**
Also available with metal tubes at \$31.20



CROSLEY MODEL 349

Five Glass Tubes, Two Bands . . . Octal-Base Tubes . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Automatic Volume Control . . . Tone Control . . . Triple-Twin Output, 13 3/4" high, 11 5/8" wide, **\$34.95**
7 1/2" deep.
Also available with metal tubes at \$36.20



CROSLEY MODEL 395

Features and tubes same as Crosley Model 349. Equally as outstanding is the performance of the five-tube, two-band chassis it houses. The cabinet front panel is of stump walnut veneer. 10 1/2" high, 16 3/4" wide, 7 1/2" deep. **\$39.95**
Also available with metal tubes at \$41.20



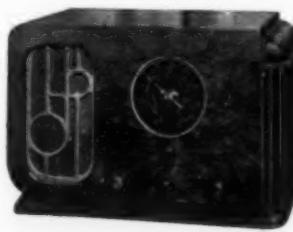
CROSLEY MODEL 449

Six Glass Tubes, Three Bands . . . Octal-Base Tubes . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Triple-Twin Output . . . Automatic Volume Control . . . Tone Control. 20" high, 14 1/4" wide, **\$44.95**
9" deep.
Also available with metal tubes at \$46.20



CROSLEY MODEL 495

Six Glass Tubes, Three Bands . . . Octal-Base Tubes . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Triple-Twin Output . . . Automatic Volume Control . . . Tone Control. 13" high, 19 3/4" wide, **\$49.95**
8 3/4" deep.
Also available with metal tubes at \$51.20



PHANTOM CONDUCTOR
The Phantom Conductor (auto-expressionator), introduced for the first time in radio receivers by Crosley earlier in the year, has been further developed and refined, so that it now embodies a full size radio tube instead of two small bulbs. The Phantom Conductor not only restores the volume and expression range of music that in the case of crescendos and fortissimos must be monitored out, or suppressed by the orchestra leader in broadcasting, but it amplifies the expression to the fullness with which the composer intended the music should be played.

MULTIVOX CONTROL
... FIDELITY CONTROL...
VIBRACOUSTIC FLOATING SOUNDING BOARD AND GIANT CURVILINEAR SPEAKER...
HIGH FIDELITY...
NEW MAGNA-CERAMIC DIAL...
CARDIAMATIC UNIT...
many models have metal tubes.



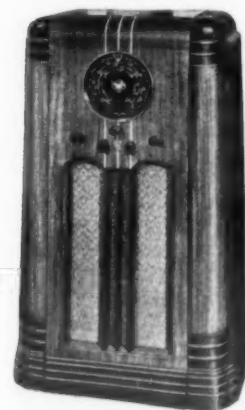
CROSLEY MODEL 899 CONSOLE

Eight Glass Tubes, Three Bands . . . Octal-Base Tubes . . . Phantom Conductor . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Timelox Tuning . . . Band Indicator on Dial . . . Shadowgraph Tuning Indicator . . . High Fidelity . . . Triple-Twin Output . . . Tone Control . . . Automatic Volume Control . . . Vibracoustic Sounding Board. 42" high, 27" wide, **\$89.95**
13 1/2" deep.
Also available with metal tubes at \$91.95



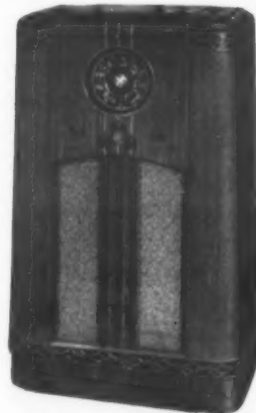
CROSLEY MODEL 117 CONSOLE

Nine Tube (Metal), Three Bands . . . Octal-Base Tubes . . . Cardiamatic Unit . . . Phantom Conductor . . . High Fidelity . . . Triple-Twin Output . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Timelox Tuning . . . Multivox Control . . . Vernimatic Dial Drive . . . Tone Control . . . Automatic Volume Control . . . Vibracoustic Sounding Board . . . 12" Curvilinear Speaker. 42 1/2" high, 26 1/4" wide, **\$117.50**
14" deep.



CROSLEY MODEL 137 CONSOLE

Ten Tube (Metal), Three Bands . . . Octal-Base Tubes . . . Cardiamatic Unit . . . Phantom Conductor . . . High Fidelity . . . Triple-Twin Output . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Band Indicator on Dial . . . Shadowgraph Tuning Indicator . . . Timelox Tuning . . . Multivox Control . . . Vernimatic Dial Drive . . . Tone Control . . . Automatic Volume Control . . . Vibracoustic Sounding Board . . . 15" Curvilinear Speaker. 43 1/4" high, 27" wide, **\$137.50**
14" deep.



CROSLEY MODEL 167 CONSOLE

Thirteen Tube (Metal), Three Bands . . . Octal-Base Tubes . . . Cardiamatic Unit . . . Phantom Conductor . . . Mystic Hand . . . High Fidelity . . . Illuminated, Full Vision, Magna-Ceramic Dial . . . Timelox Tuning . . . Fidelity Control . . . Automatic Volume Control . . . Vibracoustic Sounding Board . . . 15" Curvilinear Speaker. 44 1/4" high, 28" wide, 13 3/4" deep. **\$167.50**

Different from anything ever heard! The Crosley new-type radio receiver transmits the thrill and feeling with the voice and deed. Until you have heard this new radio you can have no idea of what truly modern reception really is. For this is radio *plus* the Phantom Conductor—*plus* 9 other great features. Study the Crosley line shown here. With Crosley you are face to face with the greatest selling opportunity in radio.

*The Greatest
Radios
Ever Built*

★ ★ ★ **WHATEVER HAPPENS
YOU'RE THERE WITH A**

CROSLEY

CROSLEY RADIO

THE CROSLEY RADIO CORPORATION - - CINCINNATI

POWEL CROSLEY, Jr., President

Home of WLW—the world's most powerful broadcasting station—70 on your dial.

(Prices Slightly Higher in Florida, Texas, Rocky Mountain States and west.)

SPECIFICATIONS

of 1936 Household Electric Refrigerators

CROSLEY

Crosley Radio Corp., Cincinnati, Ohio.

Model No.	GKT43	GKT50	GKT60	GKT70	GAT43	GAT50	GAT60	GAT70	GKQ43	GKQ50	GKQ60	GKQ70
Compressor Model No.	T1	T1	T1	T2	T1	T1	T1	T2	Q3	Q3	Q3	Q3
PRICE												
Retail price, installed	\$149.95	\$179.95	\$194.95	\$214.95	\$134.95	\$159.95	\$174.95	\$194.95	\$134.95	\$159.95	\$174.95	\$194.95
Cabinet finish, exterior	Dulux											
CABINET DIMENSIONS												
Overall height (inches)	56 1/2	56 1/2	58 1/2	58 1/2	56 1/2	56 1/2	58 1/2	58 1/2	56 1/2	56 1/2	58 1/2	58 1/2
Overall width (inches)	23 1/2	27 1/2	29 1/2	33 1/2	23 1/2	27 1/2	29 1/2	33 1/2	23 1/2	27 1/2	29 1/2	33 1/2
Overall depth (inches)	24 1/2	24 1/2	26 1/2	26 1/2	24 1/2	24 1/2	26 1/2	26 1/2	24 1/2	24 1/2	26 1/2	26 1/2
Inside height (inches)	28 1/2	28 1/2	28 1/2	30 1/2	28 1/2	28 1/2	28 1/2	30 1/2	28 1/2	28 1/2	28 1/2	30 1/2
Inside width (inches)	17 1/2	20	22 1/2	25	17 1/2	20	22 1/2	25	17 1/2	20	22 1/2	25
Inside depth (inches)	16 1/4	16 1/4	17 1/2	17 1/2	16 1/4	16 1/4	17 1/2	17 1/2	16 1/4	16 1/4	17 1/2	17 1/2
Number of doors	1	1	1	1	1	1	1	1	1	1	1	1
STORAGE CAPACITY												
Net food storage (cu. ft.)	4.33	5.07	6.01	7.00	4.33	5.07	6.01	7.00	4.33	5.07	6.01	7.00
Number of shelves	4	5	4	4	4	5	4	4	4	5	4	4
Total shelf area (sq. ft.)	9.07	12.34	14.37	15.68	9.07	12.34	14.37	15.68	9.07	12.34	14.37	15.68
Cabinet finish (interior)	Porcelain											
INSULATION												
Top (thickness in inches)	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Sides	2 1/2	3 1/2	3 1/2	3 1/2	2 1/2	3 1/2	3 1/2	3 1/2	2 1/2	3 1/2	3 1/2	3 1/2
Back	3 1/2	3 1/2	3 1/2	4	3 1/2	3 1/2	3 1/2	4	3 1/2	3 1/2	3 1/2	4
Door	1 1/2	2	2 1/2	3	1 1/2	2	2 1/2	3	1 1/2	2	2 1/2	3
Bottom	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
ICE CUBES												
Number of shallow trays	2	3	6	6	2	3	6	6	2	3	6	6
Number of deep trays	1	1	1	1	1	1	1	1	1	1	1	1
Total number of cubes	84	105	168	168	84	105	168	168	84	105	168	168
Total weight of cubes (lbs.)	5.2	6.5	10.4	10.4	5.2	6.5	10.4	10.4	5.2	6.5	10.4	10.4
COMPRESSOR												
Ice melting effect 24 hrs. (lbs.)	125	125	125	145	125	125	125	145	110	110	110	110
Motor horsepower	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/6	1/6	1/6	1/6
Refrigerant in system (oz.)	34	35	37	37	34	35	37	37	30	31	34	34
Quantity of lubricant (oz.)	25	25	25	25	25	25	25	25	10	10	10	10
Belt circumference (inches)	No belt	No belt	No belt	No belt	No belt	No belt	No belt	No belt	29	29	29	29
Belt width (64ths of an inch)	No belt	No belt	No belt	No belt	No belt	No belt	No belt	No belt	32	32	32	32
WEIGHT												
Net weight (lbs.)	334	362	407	446	319	344	397	428	345	371	420	460
Shipping weight (lbs.)	334	362	407	446	319	344	397	428	345	371	420	460
Model No.	GAQ30	GAQ35	GAQ43	GAQ50	GAQ60	GAQ70	PGKQ50	PGKQ60	PGKQ70	PGKT50	PGKT60	PGKT70
Compressor Model No.	Q3	Q3	Q3	Q3	Q3	Q3	Q3	Q3	Q3	T1	T1	T2
PRICE												
Retail price, installed	\$99.50	\$104.50	\$124.95	\$142.95	\$154.95	\$174.95	\$181.45	\$199.95	\$224.95	\$202.45	\$219.95	\$244.95
Cabinet finish, exterior	Dulux						Porcelain					
CABINET DIMENSIONS												
Overall height (inches)	36	50 1/2	56 1/2	56 1/2	58 1/2	58 1/2	56 1/2	58 1/2	58 1/2	56 1/2	58 1/2	58 1/2
Overall width (inches)	23 1/2	23 1/2	23 1/2	27 1/2	29 1/2	33 1/2	27 1/2	29 1/2	33 1/2	27 1/2	29 1/2	33 1/2
Overall depth (inches)	25	25 1/2	24 1/2	24 1/2	26 1/2	26 1/2	24 1/2	26 1/2	26 1/2	24 1/2	26 1/2	26 1/2
Inside height (inches)	17	23	28 1/2	28 1/2	28 1/2	30 1/2	28 1/2	28 1/2	30 1/2	28 1/2	28 1/2	30 1/2
Inside width (inches)	19 1/4	17 1/2	17 1/2	20	22 1/2	25	20	22 1/2	25	20	22 1/2	25
Inside depth (inches)	17 1/4	16 1/4	16 1/4	16 1/4	17 1/2	17 1/2	16 1/4	17 1/2	17 1/2	16 1/4	17 1/2	17 1/2
Number of doors	1	1	1	1	1	1	1	1	1	1	1	1
STORAGE CAPACITY												
Net food storage (cu. ft.)	3.00	3.50	4.33	5.07	6.01	7.00	5.07	6.01	7.00	5.07	6.01	7.00
Number of shelves	3	3	4	5	4	4	5	4	4	5	4	4
Total shelf area (sq. ft.)	6.92	7.44	9.07	12.34	14.37	15.68	12.34	14.37	15.68	12.34	14.37	15.68
Cabinet finish (interior)	Porcelain											
INSULATION												
Top (thickness in inches)	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Sides	2 1/2	2 1/2	2 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
Back	1 1/2	2 1/2	2 1/2	3 1/2	3 1/2	4	3 1/2	3 1/2	4	3 1/2	3 1/2	4
Door	1 1/2	1 1/2	1 1/2	2	2 1/2	3	2	2 1/2	3	2	2 1/2	3
Bottom	2 1/2	2 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
ICE CUBES												
Number of shallow trays	2	3	2	3	6	6	3	6	6	3	6	6
Number of deep trays	0	0	1	1	1	1	1	1	1	1	1	1
Total number of cubes	42	63	84	105	168	168	105	168	168	105	168	168
Total weight of cubes (lbs.)	2.6	3.9	5.2	6.5	10.4	10.4	6.5	10.4	10.4	6.5	10.4	10.4
COMPRESSOR												
Ice melting effect 24 hrs. (lbs.)	110	110	110	110	110	110	110	110	110	125	125	145
Motor horsepower	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/8	1/8	1/5
Refrigerant in system (lb.)	28	28	30	31	34	34	31	34	34	35	37	37
Quantity of lubricant (oz.)	10	10	10	10	10	10	10	10	10	25	25	25
Belt circumference (inches)	29	29	29	29	29	29	29	29	29	No belt	No belt	No belt
Belt width (64ths of an inch)	32	32	32	32	32	32	32	32	32	No belt	No belt	No belt
WEIGHT												
Net weight (lbs.)	250	296	330	353	410	442						
Shipping weight (lbs.)	250	296	330	353	410	442						

COMPRESSOR

Compressor Models T1 and T2—made by Crosley, sealed, reciprocating (horizontal piston, "Scotch-yoke" type), direct-driven compressor located above food compartment, single cylinder, 1730 r.p.m., 1 1/4-in. bore, 2 1/2-in. stroke (model T2, 3/16-in. stroke).

Compressor Model No. Q3—made by Crosley, open, reciprocating, belt-driven, located above food compartment (except in model GAQ30), single cylinder, 525 r.p.m., 1 1/4-in. bore, 1 1/2-in. stroke. Refrigerant, SO₂ in Q3 and T1, F-12 in T2. Lubricant, Suniso, Gulf, and Socony Vacuum. Shaft seal, diaphragm.

CABINET

Made by Crosley. Wood and steel frame with Balsam Wool and Thermocraft insulation, maple breaker strip, rubber moulded gasket.

HARDWARE

Made by Winters & Crampton (Crosley design) of stamped brass with chromium-plated finish.

MOTOR

Split-phase and capacitor-start type made by Delco. Oil every six months. (Sealed units permanently oiled).

CONDENSER

Made by McCord, Bush, and Heat Transfer, fan and natural draft cooled, finned tube condenser.

EVAPORATOR

Made by Crosley of corrugated sheet steel.

Capillary tube refrigerant control.

Aluminum ice trays with tray breaker.

CONTROL

Tagliabue (Model F) and Ranco adjustable temperature controls mounted inside and outside the cabinet. Manual defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: Five-year protection plan.

Serviced by: Manufacturers, distributors, and dealers.

Replacement parts are not sold to independent service companies.

SPECIAL FEATURES

On all models: Shelvador, touch-open door handle, ventilated front, glass jar set, removable bar-type shelves, removable unit, and automatic interior light (except GAQ30).

On Deluze models only: Hydrator and Storadrawer.

Specifications for all 1936 models of household electric refrigerators were first published in the April 22 issue. The entire edition of 22,500 copies was quickly sold out. To supply the demand for this data, the complete tabulations (with corrections) are reprinted in this issue. Extra copies will be available at 25 cents each. Please send cash or check with order since we cannot open charge accounts for extra copy sales.

The May 20 issue, containing Air Conditioning Specifications, is also sold out. This data will be reprinted (with additional listings) in the July 29 issue.

We still have in stock extra copies of the May 6 issue, containing Commercial Specifications. All specification issues are 25 cents per copy.

COPELAND

Copeland Refrigeration Corp., Detroit, Mich.

Model No.	436	736	936
Compressor Model No.	C2-16	C2-16	C2-20

PRICE

Retail price, installed	\$119.50	\$199.50	\$249.50
Cabinet finish, exterior	Lacquer		

CABINET DIMENSIONS

Overall height (inches)	54 1/2	58	61 1/2
Overall width (inches)	23 1/2	30 1/2	32 1/2
Overall depth (inches)	23	26 1/2	26 1/2
Inside height (inches)	26 1/2	30	33 1/2
Inside width (inches)	19 1/2	23 1/2	26 1/2
Inside depth (inches)	16 1/4	19 1/2	18 1/2
Number of doors	1		

STORAGE CAPACITY

Net food storage (cu. ft.)	4.5	7.10	9.01
Number of shelves	3	4	5
Total shelf area (sq. ft.)	8.5	14.0	17.4
Cabinet finish (interior)	Porcelain		

INSULATION

Top (thickness in inches)	2	3	3
Sides	2	3	3
Back	2	3	3
Door	2 1/2	3	3
Bottom	2	3 1/4	3 1/4

ICE CUBES

Number of shallow trays	3	2	2
Number of deep trays	0	1	2
Total number of cubes	63	98	126
Total weight of cubes (lbs.)	6	9	11

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	115	115	138
Motor horsepower	1/6	1/6	1/5
Refrigerant in system (lb.)	1	1	1
Quantity of lubricant (pt.)	7/8	7/8	7/8
Belt circumference, outside (in.)	35 29/32		
Belt width (64ths of an inch)	37		

WEIGHT

Net weight (lbs.)	280	335	370
Shipping weight (lbs.)			

COMPRESSOR

Made by Copeland, open, reciprocating, belt-driven compressor located below food compartment. Bellows shaft seal. Compressor Model No. C2-16—twin cylinder, 420 r.p.m., 1 1/4-in. bore, 1 1/2-in. stroke.

Compressor Model No. C2-20—twin cylinder, 490 r.p.m., 1 1/4-in. bore, 1 1/2-in. stroke.

Refrigerant, methyl chloride. Lubricant, Suniso.

CAB

G-E Film Revised For General Use

CLEVELAND—The sound moving picture which featured the 1936 Spring meetings held by the General Electric Co.'s specialty appliance division, has been remade for general distribution by the Sound Pictures Corp.

Titled "How to Make a Sales Presentation Stay Presented," the film contains the four-step formula for sales presentation devised and recorded by Richard C. Borden and Alvin C. Busse, New York University professors and sales consultants, who have given the talk before Chamber of Commerce and other business organizations throughout the country. Shown simultaneously at G-E meetings in 75 cities, the film was incorporated in this manufacturer's spring meeting program after A. M. Sweeney, specialty appliance sales manager, Art Scaife, advertising and promotion manager, and other G-E executives heard the two professors give the presentation before a meeting of the Cleveland Chamber of Commerce, and the Cleveland Advertising Club. Arrangements to have the talk recorded in a sound film were then made.

In the film now prepared for general distribution, G-E credit titles and individual selling technique have been deleted to make a non-commercial version. It is revised for showings in 16 or 35 millimeter sizes.

500 Expected at 'Radio' Convention of S-W

CHICAGO—More than 500 distributors, dealers, and salesmen were expected to attend the annual radio convention of Stewart-Warner Corp., held at the Drake hotel here on Monday and Tuesday of this week.

More than 20 new radio models were to be introduced, embodying several new developments in the radio field. Price range, company heads said, would be the same as last year, covering practically the entire lower and middle-priced field.

Preliminary production schedules for the radio line, officials said, are considerably larger than before. Preparations are being made to cover a radio sales increase of 100%, a jump as large as that shown by S-W refrigerator sales this year.

Parker Ice Machine Co. Receiver's Report to Be Passed on July 6

LOS ANGELES—Stockholders, creditors, and bondholders of Parker Ice Machine Co. have been ordered by U. S. District Judge Harry A. Hollzer to appear at a hearing at 10 a.m. July 6 to show cause why the final account and report of Receiver R. P. Mason should not be accepted, receiver's and attorney's fees granted, and a compromise claim against Pacific Indemnity Co. for \$8,000 accepted.

The case is L. Mundet & Son vs. Parker Ice Machine Co. At the hearing, unless cause otherwise is shown, the court will enter an order approving and settling the accounts against Parker Ice Machine Co., fixing the receiver's fee, discharging the receiver and his surety, and closing up the receivership proceedings.

The court will also determine the amount of fees to be allowed Stanley M. Arndt on his petition as attorney for Receiver Mason. Attorney Arndt's petition asks for \$1,000; fees previously paid for services rendered by himself and Attorney John Perry Wood total \$2,500.

Receiver Mason has petitioned the court for an allowance of \$20 a month from December 1, 1933, up to and including the closing of the receivership estate.

The "petition for leave to compromise claim against Pacific Indemnity Co. for \$8,000" seeks to accept \$8,000 cash in full settlement of the liability of Pacific Indemnity Co. as surety on the \$10,000 bond of W. M. Parker, former receiver.

Montgomery-Ward Plans Large Detroit Store

DETROIT — Entry of Montgomery Ward & Co. into the Detroit retail field became a certainty last week when it was learned the company has leased the property at the southeast corner of Michigan Ave. and Schaeffer Road, in Dearborn, Mich., and will begin soon to erect a new retail store on that site.

The lease on the property is for a period of 30 years, with privilege to renew it for an additional 50-year term.

The store, which will serve the Detroit area, especially the southern and western portions of the city and suburbs, will be three stories high, with basement and mezzanine. It will have a frontage of 104 feet on Michigan Ave., and 150 feet on Schaeffer Road.



*Good Insulation
in Any Good Refrigerator
is "Big Medicine"*

Buyers of electric refrigerators expect good mechanical units in any box they buy. You cannot greatly impress them with assurances of mechanical efficiency. As in a motor car engine, dependable performance is taken for granted.

But Dry-Zero Insulation in a refrigerator is a powerful selling point. It is big medicine. It is evidence of a definite advantage in economical lifetime operation. For it is a proved fact that Dry-Zero Insulation will make a continual saving of from 20c to \$2.00 per month in operating costs.

If you are fortunate enough to be selling a Dry-Zero insulated refrigerator, tell your customers about this regular saving, as long as the box lasts. If you want more evidence, tell us. Ask for free copies of an interesting and colorful folder giving the facts that you can give to your prospects.

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The Most Efficient
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• 687 Broadview Ave.
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FRIGIDAIRE

Frigidaire Corp., Dayton, Ohio.

Model No.	Koldchest	D3-36	DRS5-36	DRS6-36	Master 4-36	5-36	6-36	7-36	Super 4-36	5-36	6-36	7-36	9-36	WP12-36	WP15-36	Premier	Imperial
Compressor Model No.	Sealed in													FH336	FH336	FH336	FH336
PRICE	Zone 1 prices																
Retail price, installed	\$ 84.50	\$104.50	\$144.50	\$164.50	\$129.50	\$164.50	\$189.50	\$219.50	\$154.50	\$184.50	\$209.50	\$249.50	\$309.50	\$379.50	\$471.50	\$436.50	\$526.50
Cabinet finish, exterior	Dulux								Porcelain								
CABINET DIMENSIONS																	
Overall height (inches)	36	44%	53%	56%	50%	54%	58%	59%	50%	54%	58%	59%	60%	63%	64	63%	64
Overall width (inches)	23%	22%	28%	30%	24%	28%	29%	31%	24%	28%	29%	31%	32%	38%	46%	38%	46%
Overall depth (inches)	20 1/2	22 1/2	24 1/2	24 1/2	25	25	25	25 1/2	25	25	25	25 1/2	27%	30 1/2	30 1/2	30 1/2	30 1/2
Inside height (inches)	14%	23%	29%	33%	27 1/2	29%	33%	34%	27 1/2	29%	33%	34%	35%	35%	35%	35%	35%
Inside width (inches)	19%	17%	22 1/2	24	19 1/2	22 1/2	24	25 1/2	19 1/2	22 1/2	24	25 1/2	26%	32	39%	32	39%
Inside depth (inches)	13%	13%	14	14	14	14	14	15%	14	14	14	15%	17%	19%	19%	19%	19%
Number of doors	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
STORAGE CAPACITY																	
Net food storage (cu. ft.)	2.1	3.1	5.1	6.2	4.1	5.1	6.2	7.2	4.1	5.1	6.2	7.2	9.1	12.1	15.1	10.0	13.1
Number of shelves	2	3	3	4	3	3	4	4	3	3	4	4	4	9	8	5	6
Total shelf area (sq. ft.)	4.1	6.4	10.7	13.6	8.9	10.7	13.6	15.8	8.9	10.7	13.6	15.8	19.3	24.6	29.4	19.6	26.6
Cabinet finish (interior)	Porcelain																
INSULATION																	
Top (thickness in inches)	2	2	2	2	2	2	2	2	2	2	2	2	2	2 1/2	2 1/2	2 1/2	2 1/2
Sides	2	2	2 1/4	2 1/4	2	2 1/4	2 1/4	2 1/4	2	2 1/4	2 1/4	2 1/4	2 1/4	2 1/2	2 1/2	2 1/2	2 1/2
Back	2	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Door	1 1/2	2	2 1/4	2 1/4	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Bottom	2	2	3	3	3	3	3	3	3	3	3	3	3	2 1/2	2 1/2	2 1/2	2 1/2
ICE CUBES																	
Number of shallow trays	2	2	3	4	2	4	4	6	2	4	4	6	6	6	8	6	6
Number of deep trays	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1*	1*
Total number of cubes	36	41	63	84	41	83	83	120	41	82	82	120	136	156	208	156	156
Total weight of cubes (lbs.)	3	4	6	8	4	8	8	12	4	8	8	12	14	19	25 1/2	19	19
COMPRESSOR																	
Ice melting effect 24 hrs. (lbs.)	1/16	1/16	1/12	1/12	1/16	1/12	1/12	1/7	1/16	1/12	1/12	1/7	1/7	1/3	1/3	1/3	1/3
Motor horsepower	14	15	19	19	18	19	19	23	18	19	19	23	26	54	58	58	58
Refrigerant in system (oz.)	7	7	7	7	7	7	7	7	7	7	7	10	10	16	16	16	16
Quantity of lubricant (oz.)	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts
Belt circumference (inches)	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts
Belt width (64ths of an inch)	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts	No belts
WEIGHT																	
Net weight (lbs.)	150	168	257	280	224	295	298	348	244	326	337	389	437	566	602	602	652
Shipping weight (lbs.)																	

COMPRESSOR
Models of 9-cu. ft. capacity or less: Made by Frigidaire, 1,730 r.p.m., sealed, rotary, direct-driven compressor located below food compartment. No shaft seal.

Refrigerant, F-114. Lubricant, special Frigidaire.

Models larger than 9 cu. ft.: Compressor Model No. FH-336—twin cylinder, 575 r.p.m., 1 1/4-in. bore, 1 1/8-in. stroke.

Made by Frigidaire, open, reciprocating, belt-driven compressor located below food compartment. Shaft seal, special Frigidaire.

Refrigerant, Freon. Lubricant, special Frigidaire.

CABINET

Made by Frigidaire. Frameless (except models larger than 9 cu. ft.). Special Frigidaire insulation, Panelyte breaker strip, soft rubber, balloon-type gasket.

HARDWARE

Made by Ternstedt. Chromium-plated finish.

MOTOR

Split-phase type (except models larger than 9 cu. ft., repulsion-induction type) made by Delco. Permanently oiled.

CONDENSER

Models larger than 6-cu. ft. capacity—Frigidaire fan-cooled finned-radiator type condenser.

Models of 6-cu. ft. capacity and less—Frigidaire natural draft cooled plate-type condenser.

EVAPORATOR

Made by Frigidaire, brass plate type, brazed and silver soldered.

Restrictor refrigerant control, except models larger than 9 cu. ft. which use high side float. Anodized aluminum and rubber ice trays. Automatic tray release. Quickcube tray. Rubber grids.

CONTROL

Frigidaire adjustable temperature control, mounted inside the

cabinet, except Koldchest, D3-36, WP12-36, WP15-36, Premier, and Imperial which are outside. Semi-automatic defrosting. Vacation cycle on all but Koldchest and D3-36. Automatic reset overload protector on all except models larger than 9 cu. ft., which are manual.

POLICY

Guarantee on cabinet: One-year warranty.

Guarantee on system: Five-year protection plan.

Serviced by: Authorized Frigidaire outlets.

Replacement parts are sold to independent service companies through distributors.

SPECIAL FEATURES

Built-in thermometer, portable utility shelf, and two hydrators on Super models, sliding shelves on Super and Master models, removable ice tray making space for freezing of desserts, roasts, bulk ice cream, etc.

*Premier and Imperial models will freeze 14-lb. block of ice additional or store approximately 100 ice cubes.

GENERAL ELECTRIC

General Electric Co., Appliance & Merchandising Dept., Cleveland, Ohio.

Model No.	M-4	M-5	T-5	M-6	SM-66	M-7	T-7	TM-9	V-4	V-5	V-7	LK-1	LK-2	KF-3	KF-12	KF-15
Compressor Model No.	CG-1	CK-1	CK-1	CK-2	CK-15	CK-2	CK-2	CK-30	CF-1	CF-1	CF-2	LK-1	LK-2	CM-311	CM-34	CM-34
PRICE	First Zone															
Retail price, installed	\$134.50	\$169.00	\$194.00	\$204.00	\$179.50	\$239.00	\$274.00	\$320.00	\$144.50	\$179.00	\$249.00	\$ 84.50	\$ 89.50	\$119.50	\$430.00	\$490.00
Cabinet finish, exterior	Glyptal		Porc.	Glyptal			Porcelain		Glyptal						Porcelain	
CABINET DIMENSIONS																
Overall height (inches)	61%	64%	65%	63%	61%	66	67%	68	52%	52%	56%	36	36	35%	62 1/2	62 1/2
Overall width (inches)	23%	24	24	28%	28%	28%	28%	34%	23%	27%	30	21	21	24	39	46
Overall depth (inches)	19%	21 1/2	21 1/2	22%	22%	22%	22%	26%	24%	24%	26%	23%	23%	22%	28	28
Inside height (inches)	27 1/2	32 1/2	32 1/2	32	32 1/2	33%	33%	34%	28%	28%	32 1/2	13%	13%	18%	37	37
Inside width (inches)	18 1/2	18	18	22	22	22%	22%	27 1/2	18	21%	24	16	16	19%	33	40
Inside depth (inches)	14%	15%	16	16 1/2	16%	16%	17	19%	15%	15%	17	16	16	15%	19 1/2	19 1/2
Number of doors	1														2	2
STORAGE CAPACITY																
Net food storage (cu. ft.)	4.0	5.1	5.0	6.4	6.6	7.2	7.0	9.6	4.3	5.2	7.0	2.0	2.0	2.9	12.5	15.4
Number of shelves	3	3	3	3	3	3	3	3	3 1/2	3 1/2	3	..	..	1 1/2	4	4 1/2
Total shelf area (sq. ft.)	8.1	8.9	8.9	11.8	11.0	12.5	12.5	16.1	8.6	10.2	13.0	..	..	5.7	22.7	31.3
Cabinet finish (interior)	Porcelain															
INSULATION																
Top (thickness in inches)	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	3	2 1/4	2 1/4	2 1/4	..	..	2	2 1/4	2 1/4
Sides	2 1/4	2 1/4	2 1/4	3	3	2 1/4	2 1/4	2 1/2	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4
Back	1 1/2	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	1 1/2	1 1/2	2 1/4	3%	3%	1 1/2	3 1/4	3 1/4
Door	2 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	2	2	3 1/4	3 1/4	3 1/4
Bottom	2 1/4	3	2 1/4	2 1/4	2 1/4	2 1/4	3 1/4	3 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	1 1/2	3	3
ICE CUBES																
Number of shallow trays	2	2	2	4	2	4	4	4	2	2	4	2	2	2	6	6
Number of deep trays	0														1	1
Total number of cubes	40	40	40	84	40	84	84	84	40	40	84	20	20	40	128	128
Total weight of cubes (lbs.)	4	6	6	8	6	11	11	11	4	6	11	2	2	4	14 1/2	16 1/2
COMPRESSOR																
Ice melting effect 24 hrs. (lbs.)	83	83	83	92	88	92	92	125	83	83	92	80	80	..	176	176
Motor horsepower	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/6	1/8	1/8	1/8	1/8	1/8	1/6	1/3	1/3
Refrigerant in system (lbs.)	1.75	1.75	1.75	2.25	1.75	2.25	2.25	2.7	1.75	1.75	2.0	1.4	1.4	2.0	3.25	3.25
Quantity of lubricant (pts.)	4													1 1/4	1 1/4	1 1/4
Belt circumference (inches)	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts
Belt width (64ths of an inch)	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts	No Belts
WEIGHT																
Net weight (lbs.)	255	352	362	488	462	500	506	700	320	340	415	180	180	..	762	862
Shipping weight (lbs.)	M1A80	M1A120	M1A120	M1A121	M1A130	M1A121	M1A121	M1A122	M1A78	M1A78	M1A78	M1A65	M1A65	M1A72	M1A87	M1A87
Control Model No.																

COMPRESSOR
Made by General Electric, CM-311, CM-34, open; all others, sealed; reciprocating; CM-311, CM-34, belt-driven; all others, direct-driven; compressor located above on M and T models; below food compartment on all others.

Compressor Model No. CF-1, CF-2, LK-1, LK-2, CG-1, CK-1, CK-2, CK-15—single cylinder, 1,740 r.p.m., 1 1/4-in. bore, 0.66-in. stroke.

Compressor Model No. CM-34—twin cylinder, 550 r.p.m., 1 1/4-in. bore, 1 1/4-in. stroke.

Compressor Model No. CK-30—single cylinder, 1,740 r.p.m., 1 1/4-in. bore, 0.85-in. stroke.

Compressor Model No. CM-311—Single cylinder, 350 r.p.m., 1 1/2-in. bore, 1 1/2-in. stroke.

Engineering

Ruppricht Outlines 20 Methods Of Defrosting Coils In Refrigerators

SKYTOP, Pa.—Reviewing 20 methods of controlling defrosting operations, Siegfried Ruppricht, New York City consulting engineer, would not commit himself as to which one of the many methods is best, pointing out that in most cases circumstances determine which method should be employed.

In general, there are two scientific methods of defrosting—melting the ice with some outside agent, such as an electric heating element, or so devising the system that gas from the condenser or a natural temperature rise will melt the frost.

Two Separate Problems

Any defrosting problem, Mr. Ruppricht declared, consists of two separate parts, one actually dealing with the removal of the frost, and the other with the control of this operation. In other words, it involves two questions, how to defrost and when to defrost.

Frost produced by refrigeration will be found of very different density and structure depending on the circumstances of its formation and on its age. Frost out of air which is already below 32° F. is fluffy and brittle, easy to remove mechanically. If its formation is accompanied by condensation, frost is more solid. Moisture travels in frost as in insulation, converting it gradually into solid ice, its density increasing tenfold given enough time.

Summary of Methods

Following is a summary of methods, or classes of them:

1. Several methods exist for removing frost without employing heat, the simplest being to scrape and pick it off the surface. This method is barbarous, but it works. Its history is studded with innumerable leaks caused by sharp implements used indiscriminately.

2. Another method also employing force, but which works only with fluffy frost, is to increase the pressure in the evaporator compartment gradually to about 50 lb./in.² and to release it suddenly into the atmosphere. All the air cells in the frost burst upon the sudden reduction of the ambient pressure, and the outrushing air carries the frost away. The frost is killed off getting "the bends." This method has the disadvantage of requiring the evaporator compartment to be pressure proof, but this is not unusual with liquid air plants.

Use of Rubber Coating

3. The mechanical removal of frost could be greatly facilitated by coating the surface with rubber to which ice does not stick, as is widely known from rubber galoshes worn in the snow and from the rubber trays for ice cubes.

4. Frost can also be removed by spraying brine over it, washing it away. A variation of this method is to have the evaporator removed from the air circulation and placed in the brine collecting tank, leaving to the brine spray the additional task of removing the B.t.u. from the air. This is called the brine spray system of refrigeration or the indirect open spray method. In some installations of this type, the brine is cascaded instead of sprayed.

Brine Dripping on Coils

5. A method similar to the former is placing perforated troughs filled with deliquescent salt above the evaporator coils. The salt and absorbed moisture form brine which drips on the coils washing the frost off. While the former two methods require re-concentrating the brine, which may be less cumbersome than refilling the troughs, the latter has the advantage of eliminating the necessity of pumping brine.

6. These chemical methods of removing the frost right after or when it is formed may also be considered as frost preventing. Much effort has been extended in this direction by raising the surface temperature above 32° F., in connection with commercial installations operating substantially above the freezing point. However, keeping meat safely above the freezing point and still dry enough to prevent it from getting slimy in adverse weather requires either a low surface temperature or ample heat travel through the box. This increases the load, by increasing the number of B.t.u. pumped, just as

by water freezing in the piping during regular operation.

8. In refrigerators operated well above the freezing point, two evaporators may be used alternately, and the direction of the air flow changed accordingly to make it first pass the frosted evaporator, melting its frost and receiving its final chilling as it passes over the evaporator which was defrosted formerly and is now in operation. This system involves the expense and the controlling of the double evaporator equipment and its ductwork but permits permanent operation of the plant.

Interruption of Refrigeration

9. With smaller installations such as butcher boxes and household refrigerators, interruption of refrigeration is easily permissible and quite sufficient to effect defrosting of the chilling element within reasonably short time, heat from the box being available for melting the frost, thus re-utilizing the effort expended in forming the frost by cooling the box with it. Whether this is done within every cycle of operation or in intervals comprising quite a number of them is immaterial.

10. This method incidentally also loosens ice trays frozen solid in the chilling unit, and the same can be

said of a method in which electricity is used for melting the frost on the outer surface of where the trays rest. This system functions very rapidly, requiring only minutes and making it worth while to wait for it and thus eliminate the possibility of the unremoved drip water being re-evaporated before the pan is emptied by the user. It seems rather a luxury today, but it may be considered a necessity tomorrow.

Heating Element Employed

11. A similar method, using a rod-shaped heating element clamped to the coil, is especially advantageous where this accessory is to be added after the system already has been installed. Obviously, the elements must be selected as to size to make impossible melting of the solder in case the current is accidentally left turned on indefinitely.

12. A third way of applying electricity to defrosting is used with brine coils. The coil to be freed of frost is shut off from the circulation and is hose-connected to the portable brine heater and circulator.

13. More economical and less cumbersome is the method of having a brine coil thermally attached to the condenser or its cooling-water discharge or source and connected to a

pair of defrosting mains with a brine pump. The coil to be defrosted is merely shut off the cold brine net, and a set of valves opened connecting it to the defrosting mains. Heat is then carried from the condenser to the coil, melting the frost and effecting at least a saving of cooling water.

Blast of Heated Air

14. Heat from an electric element, or from outside the refrigerated space, also may be applied in a blast of air. This requires temporarily baffling off the coil compartment but is about the safest method there is. It is de facto an attachment to any regular commercial system adapted to low temperature work, and this method has therefore found favor with circles exporting to overseas countries.

15. Less expensive, but requiring the evaporator to be of suitable design, is the method whereby heat is taken from the air outside of the refrigerator, but it is carried into the interior of the evaporator. When the defrosting valve is opened, the compressor merely circulates refrigerant gas at a pressure resultant from the temperature and area of the heat absorbing surface (suction pipe, compressor, condenser, defrosting pipe) and the temperature and area of the

(Concluded on Page 11, Column 1)

Announcing ... RANCO Commercial CONTROLS



RANCO revolutionized the domestic refrigerator thermostat industry—by the introduction of small, compact, dependably accurate controls. By breaking entirely away from the idea of utilizing clumsy, complicated adaptations of commercial installation, Ranco made refrigeration history—millions of friends—and a proud name for a worthy product.

Now Ranco offers another contribution to electrical refrigeration progress—characteristic Ranco-engineered, Ranco-built units for pressure and temperature control of commercial refrigeration.

These controls are, first of all, completely dependable. They are built for enduring service. In appearance and in performance they reveal convincingly the fundamental soundness and simplicity that has always characterized Ranco Products.

Features? Plenty of them! And all of proved practicability. Ranco recognized no need for "just another commercial control". These precision instruments of rugged reliability bring to the industry IMPROVEMENTS in performance—IMPROVEMENTS in convenience and accessibility—IMPROVEMENTS in craftsmanship—that will win the quick approval of all men concerned with commercial refrigerator manufacture and operation.

The complete story of these thoroughly tested units is given in our new Bulletin No. 658. You are invited to write for your copy at once.

RANCO

COLUMBUS
OHIO

DAYTON

Heinz & Munschauer Co., Buffalo, N. Y.

Model No.	4-S-2	5-S-2	6-S-4	6-D-3	7-D-4	8-D-4
Compressor Model No.	500A	500A	500A	500A	500A	500A

PRICE

Retail price, installed.....	Porcelac
Cabinet finish, exterior.....	Porcelac

CABINET DIMENSIONS

Overall height (inches).....	49 1/4	55 1/4	55 1/4	56 1/4	56 1/4	56 1/4
Overall width (inches).....	23 1/4	24	28	28 1/4	32 1/4	35 1/4
Overall depth (inches).....	23	25	25	26 1/4	26 1/4	26 1/4
Inside height (inches).....	24	29 1/4	29 1/4	29 1/4	29 1/4	29 1/4
Inside width (inches).....	18 1/4	18 1/4	22 1/4	22 1/4	25 1/4	29 1/4
Inside depth (inches).....	26 1/4	17	17	17	17	17
Number of doors.....	1					2

STORAGE CAPACITY

Net food storage (cu. ft.).....	4.02	5.02	6.04	6.04	7.05	8.05
Number of shelves.....	3	5	3	5	6	7
Total shelf area (sq. ft.).....	8.2	9.5	11.3	12.83	15.08	15.83
Cabinet finish (interior).....	Porcelain					

INSULATION

Top (thickness in inches).....	2 1/2	3	3	3	3	3
Sides.....	2	2 1/2	2 1/2	3	3	3
Back.....	2	2 1/2	2 1/2	3	3	3
Door.....	2	2 1/2	2 1/2	3	3	3
Bottom.....	2	2 1/2	2 1/2	3	3	3

ICE CUBES

Number of shallow trays.....	2	2	2	3	4	4
Number of deep trays.....	0	0	1	0	0	0
Total number of cubes.....	42	42	84	84	112	112
Total weight of cubes (lbs.).....	5	5	6 1/4	7 1/2	10	10

COMPRESSOR

Ice melting effect 24 hrs.	100	100	100	100	100	133
Motor horsepower.....	1/6	1/6	1/6	1/6	1/6	1/4
Compressor speed (r.p.m.).....	480	480	480	480	480	530
Refrigerant in system.....						
Quantity of lubricant.....						
Belt circumference (inches).....	34	34	34	34	34	34
Belt width (64ths of inch).....	34	34	34	34	34	34

WEIGHT

Net weight (lbs.).....	234	266	288	296	333	350
Shipping weight (lbs.).....						

COMPRESSOR

Made by Tecumseh, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. 500A—single cylinder, 480 r.p.m., (530 on model 8-D-4), 1 7/16-in. bore, 1 7/16-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, Suniso No. 3. Shaft seal, syphon.

CABINET

Made by Heinz & Munschauer. Wood frame with Balsam Wool insulation, Bakelite (D models) and Masonite (S Models) breaker strip, Miller balloon type rubber gasket.

HARDWARE

Made by Grand Rapids Brass and Winters & Crampton. Chrome-plated brass.

MOTOR

Capacitor type made by Leland. Oil every four months.

CONDENSER

Made by Fedders Mfg. Co., fan cooled, conventional fin-type condenser.

EVAPORATOR

Made by Mullins, porcelain on steel, and by Heinz & Munschauer, copper wrapped tubing on sleeve. Float refrigerant control on Mullins evaporator and Mayson and Heinz & Munschauer expansion valve on others.

Aluminum ice trays. One rubber tray on D models.

CONTROL

Ranco adjustable temperature control. Types KRV and KRH, mounted inside the cabinet. Manual or semi-automatic defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: None.

Guarantee on system: One year warranty.

Serviced by: Distributor.

Replacement parts are sold to independent service companies.

SPECIAL FEATURES

All models—evaporator door. D models—vegetable freshener and door basket.

FAIRBANKS-MORSE

Fairbanks-Morse & Co., Home Appliance Division, Indianapolis, Ind.

Model No.	C-4A	C-4	C-5	C-6	C-6S	C-7	B-4	B-5	B-6	B-6S	B-8
Compressor Model No.	UC-1	UC-1	UC-1	UC-1	UC-2	UC-2	B-1	B-1	B-1	B-2	B-2

PRICE

Retail price.....	F.O.B. Factory
Cabinet finish, exterior.....	Dulux

CABINET DIMENSIONS

Overall height (inches).....	51 1/2	51 1/2	56	56 1/2	56 1/2	61	50 1/2	55 1/2	55 1/2	55 1/2	58 1/2
Overall width (inches).....	24 1/4	24 1/4	25 1/4	28 3/4	28 3/4	28 3/4	23 1/4	25 1/4	28 3/4	28 3/4	34
Overall depth (inches).....	23 3/4	23 3/4	24 1/4	24 1/4	24 1/4	24 1/4	21 1/4	22 1/4	23 1/4	23 1/4	23 3/4
Inside height (inches).....	24 1/4	24 1/4	29 1/4	29 1/4	29 1/4	34 1/4	24 1/4	29 1/4	29 1/4	29 1/4	32 1/4
Inside width (inches).....	18 1/4	18 1/4	19 1/4	22 1/4	22 1/4	22 1/4	18 1/4	19 1/4	22	22	26 1/4
Inside depth (inches).....	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4
Number of doors.....	1										

STORAGE CAPACITY

Net food storage (cu. ft.).....	4.2	4.2	5.4	6.3	6.2	7.2	4.14	5.11	6.01	6.01	8.01
Number of shelves.....	2.25	9.25	10.55	12.55	12.26	14.06	9.25	10.55	12.55	12.26	15.76
Total shelf area (sq. ft.).....	Porcelain										

INSULATION

Top (thickness in inches).....	2 1/2	2 1/2	3 1/2	3 1/2	3 1/2	3 1/2	2	3	2 1/2	2 1/2	3 1/2
Sides.....	2 1/2	2 1/2	2 1/2	3	3	3	2	2 1/2	3	3	3 1/2
Back.....	2	2	2 1/2	3	3	3	2	2 1/2	3	3	3 1/2
Door.....	3	3	3	3	3	3	3	3	3	3	3
Bottom.....	2	2	2 1/2	3	3	3	2	2 1/2	3	3	3 1/2

ICE CUBES

Number of shallow trays.....	2	2	3	3	4	4	2	1	1	2	2
Number of deep trays.....	0	0	0	0	0	0	0	1	1	1	1
Total number of cubes.....	42	42	63	63	84	84	42	63	63	84	84
Total weight of cubes (lbs.).....	5	5	7 1/2	7 1/2	10	10	5	7 1/2	7 1/2	10	10

COMPRESSOR

Ice melting effect 24 hrs. (lbs.).....

Motor horsepower.....

Refrigerant in system (oz.).....

Quantity of lubricant (oz.).....

Belt circumference (inches).....

Belt width (64ths of an inch).....

WEIGHT

Net weight (lbs.).....

Shipping weight (lbs.).....

CONDENSER

Made by Fairbanks-Morse, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. UC-1—single cylinder, 445 r.p.m., 1 7/16-in. bore, 1 7/16-in. stroke.

Compressor Model No. UC-2—twin cylinder, 445 r.p.m., 1 7/16-in. bore, 1 7/16-in. stroke.

Compressor Model No. B-1—single cylinder, 500 r.p.m., 1 1/2-in. bore, 1 7/16-in. stroke.

Compressor Model No. B-2—twin cylinder, 350 r.p.m., 1 1/2-in. bore, 1 7/16-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, Sunisco No. 2. Shaft seal, bellows.

CABINET

Made by Fairbanks-Morse. Maple frame with Balsam Wool insulation, Tylac breaker strip, rubber gasket.

HARDWARE

Made by National Lock Co. Chrome finish.

MOTOR

Capacitor type made by Fairbanks-Morse. Oil yearly.

CONDENSER

Made by Fedders, fan cooled, finned tube condenser.

EVAPORATOR

Made by Fedders, electro-tinned copper tube and sleeve. Thermostatic expansion valve refrigerant control, made by Detroit Lubricator. Alumilited aluminum ice trays. Refrigerated shelf. Ice tray release.

CONTROL

Cutler-Hammer adjustable temperature control, mounted inside the cabinet. Model No. Wide-cycle defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year, plus 4-year optional plan.

Serviced by: Dealer.

Replacement parts are not sold to independent service companies.

SPECIAL FEATURES

Conservador, touch-open door opener, interior light.

ICE-O-MATIC

Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Model No.	D-3641	D-3651	D-3662	D-3682	P-3662	P-3682	AP-12	AP-15	AP-19
Compressor Model No.	TS-12	TS-12	T-16	T-16	T-16	T-16	T-25	B-33	B-33

PRICE

Retail price, installed.....	Dulux	Porcelain
Cabinet finish, exterior.....		

CABINET DIMENSIONS

Overall height (inches).....	52 1/2	56 1/4	58 1/2	63	58 1/2	63	67 1/4	70	72
Overall width (inches).....	24 3/4	26 3/4	29	31 1/4	29	31 1/4	40	44	48
Overall depth (inches).....	20 1/4	20 1/4	20 1/4	21 1/4	20 1/4	21 1/4	26	26	27 1/4
Inside height (inches).....	26	29 1/4	31 1/4	35 1/4	31 1/4	35 1/4	34	36	38
Inside width (inches).....	19	21	23 1/4	25 1/4	23 1/4	25 1/4	33 1/4	37 1/4	41 1/4
Inside depth (inches).....	16	16	16	16	16	16	19	20	21
Number of doors.....	1						2		

STORAGE CAPACITY

Net food storage (cu. ft.).....	4.20	5.30	6.40	7.80	6.40	7.80	...	...	...
Gross food storage (cu. ft.).....	4.60	5.80	6.92	8.40	6.92	8.40	12.5	15.6	19.2
Number of shelves.....	5	5	5	7	5	7	7	7	7
Total shelf area (sq. ft.).....	10.25	11.45	13.3	18.9	13.3	18.9	28.5	33.3	38.6
Cabinet finish (interior).....	Porcelain								

INSULATION

Top (thickness in inches).....	2 1/2	2 1/2	2 1/2	3	2 1/2	3	3	3	3
Sides.....	2 1/2	2 1/2	2 1/2	3	2 1/2	3	3	3	3
Back.....	2 1/2	2 1/2	2 1/2	3	2 1/2	3	3	3	3
Door.....	2 1/2	2 1/2	2 1/2	3 1/4	2 1/2	3 1/4	3 1/4	3	3
Bottom.....	2 1/2	3	3	3 1/4	3	3 1/4	3 1/4	3	3

ICE CUBES

Number of shallow trays.....	3	3	4	5	4	5	4	4	5
Number of deep trays.....	0								
Total number of cubes.....	54	63	84	105	84	105	84	84	105
Total weight of cubes (lbs.).....	3.75	6.41	8.54	10.68	8.54	10.68	11.2	11.2	16

COMPRESSOR

Ice melting effect 24 hrs. (lbs.).....

Motor horsepower.....

Refrigerant in system (oz.).....

Quantity of lubricant (pts.).....

Belt circumference (inches).....

Belt width (64ths of an inch).....

WEIGHT

Net weight (lbs.).....

Shipping weight (lbs.).....

CONDENSER

Made by Williams, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. TS-12—single cylinder, 400 r.p.m., 1 5/16-in. bore, 1 5/16-in. stroke.

Compressor Model No. T-16—twin cylinder, 300 r.p.m., 1 5/16-in. bore, 1 5/16-in. stroke.

Compressor Model No. T-25—twin cylinder, 410 r.p.m., 1 5/16-in. bore, 1 5/16-in. stroke.

Compressor Model No. B-33—twin cylinder, 355 r.p.m., 1 1/2-in. bore, 1 1/2-in. stroke.

Refrigerant, methyl chloride. Lubricant, Vacuum Oil No. S-1044. Shaft seal, steel rotating on bronze seat.

CABINET

Made by Williams and Midwest Stamping & Enameling Co.

Steel frame (wood on AP models) with Balsam Wool insulation, Tylac breaker strip, rubber gasket.

HARDWARE

Made by Winters & Crampton. Chromium-plated finish.

MOTOR

Capacitor start and run type, made by Williams.

Oil once a year.

CONDENSER

Made by Fedders (

Melchior, Armstrong, Dessau Co., Inc.
300 Fourth Ave.
New York City, N. Y., U.S.A.

The one and only Kerotest Diaphragm Packless Valve—known all over the refrigeration world for its long service and pressure-proof dependability.

GRUNOW

General Household Utilities Co., Chicago, Ill.

Model No.	50M	51M	58M	61M	67M	70R	82R
Compressor Model No.	681	681	681	681	681	831	831

PRICE

Retail price, installed.	Grunow-deluxe (Alkyd)						
Cabinet finish, exterior.							

CABINET DIMENSIONS

Overall height (inches)	53½	53½	56½	57½	58½	58½	62½
Overall width (inches)	24½	24½	25½	27½	29½	29½	31½
Overall depth (inches)	24½	24½	26½	25½	26½	26½	26½
Inside height (inches)	28½	28½	31½	32	32½	32½	36
Inside width (inches)	19½	19½	19½	21½	23	23	25
Inside depth (inches)	17½	17½	17½	16½	16½	16½	16½
Number of doors	1						

STORAGE CAPACITY

Net food storage (cu. ft.)	5.03	5.03	5.6	6.02	6.7	6.7	8.2
Number of shelves	3	3	3	4	4	4	5
Total shelf area (sq. ft.)	10.4	10.7	10.78	11.8	14.5	13.72	15.2
Cabinet finish (interior)	Porcelain						

INSULATION

Top (thickness in inches)	2	2	2½	2½	3	3	3
Sides	2	2	2½	2½	3	3	3
Back	2	2	2½	2½	3	3	3
Door	2½	2½	3½	2½	3½	3½	3½
Bottom	2½	2½	2½	3	3	3	3

ICE CUBES

Number of shallow trays	2	2	2	2	2	4	4
Number of deep trays	0	1	1	1	1	1	1
Total number of cubes	64	128	128	128	128	156	156
Total weight of cubes (lbs.)	5	10	10	10	10	12½	12½

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	110	110	110	110	110	136	136
Motor horsepower	1/6	1/6	1/6	1/6	1/6	1/5	1/5
Refrigerant in system (lbs.)	3.53	3.8	3.8	3.8	3.8	4.1	4.1
Quantity of lubricant (oz.)	36	36	36	36	36	36	36
Belt circumference (inches)	No belts						
Belt width (64ths of an inch)	No belts						

WEIGHT

Net weight (lbs.)	244	256	290	285	336	378	420
Shipping weight (lbs.) (approx.)	320	330	395	360	445	445	515

COMPRESSOR

Made by Grunow, sealed, rotary, direct-driven compressor located below food compartment. Compressor Model No. 681—1730 r.p.m. Compressor Model No. 831—1730 r.p.m. Refrigerant, Carrene (CH₂Cl₂). Lubricant, Grunow brand. No shaft seal.

CABINET

Made by Grunow. Steel frame, Dry-Zero insulation, bakelite breaker strip (wood on 50M, 51M, 61M), rubber gasket.

HARDWARE

Made by various firms from Grunow dies. Chromium finish.

MOTOR

Capacitor type made by Grunow. Permanently oiled.

CONDENSER

Made by McCord Radiator & Mfg. Co., fan cooled, finned tube condenser.

EVAPORATOR

Made by Grunow, "O" type with single header made of sheet brass, hydrogen brazed. Carrene meter refrigerant control. Anodic aluminum and rubber ice trays. Ice tray release on models 58M, 61M, 67M, 70R, 82R.

CONTROL

Cutler-Hammer adjustable temperature control No. 10708, mounted inside the cabinet. Wide-cycle defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.
Guarantee on system: One year plus four-year service contract.
Serviced by: Dealers or distributors.
Replacement parts are not sold to independent service companies.

SPECIAL FEATURES

All models—interior light, rapid freeze position on control. Models 70R, 82R—foot pedal door opener.

GIBSON

Gibson Electric Refrigerator Corp., Greenville, Michigan.

Model No.	S-46	S-66	S-86	SD-646	CB-696	PCB696	CB796	PCB796
Compressor Model No.	H-6	H-6	H-6	H-6	H-6	H-6	H-6	H-6

PRICE

Retail price, installed.	Lacquer							
Cabinet finish, exterior.	Lacquer							

CABINET DIMENSIONS

Overall height (inches)	50½	55½	60½	55½	57½	57½	60½	60½
Overall width (inches)	24	29½	33½	29½	30	30	30	30
Overall depth (inches)	21½	26	26½	26	26½	26½	27½	27½
Inside height (inches)	26½	29½	33½	29½	31½	31½	33½	33½
Inside width (inches)	19½	23½	27	23½	23½	23½	23½	23½
Inside depth (inches)	14½	16	16	16	16	16	17½	17½
Number of doors	1							

STORAGE CAPACITY

Net food storage (cu. ft.)	4.0	6.0	8.0	6.0	6.0	6.0	7.0	7.0
Number of shelves	3	5	6	4	4	4	5	5
Total shelf area (sq. ft.)	7.5	11.8	16.2	11.8	12.0	12.0	15.8	15.8
Cabinet finish (interior)	Porcelain							

INSULATION

Top (thickness in inches)	2	2½	3	2½	2	2	2½	2½
Sides	2	3	3½	3	3	3	3	3
Back	2	3	3½	3	3	3	3½	3½
Door	2½	3	3	3	3½	3½	3½	3½
Bottom	2	3	3½	3	3	3	3½	3½

ICE CUBES

Number of shallow trays	2	2	3	4	4	4	3	3
Number of deep trays	0	1	1	1	1	1	2	2
Total number of cubes	42	84	105	105	105	105	105	105
Total weight of cubes (lbs.)	2½	5	6½	9½	9½	9½	10½	10½

COMPRESSOR

Ice melting effect*	175	175	175	175	175	175	175	175
Motor horsepower	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/5
Refrigerant in system (oz.)	41	56	56	56	56	56	56	56
Quantity of lubricant (oz.)	16	16	16	16	16	16	16	16
Belt circumference (inches)	No belts							
Belt width (64ths of an inch)	No belts							

WEIGHT

Net weight (lbs.)	247	310	375	324	341	357	361	380
Shipping weight (lbs.)								

COMPRESSOR

Made by Gibson, sealed, reciprocating, direct-driven compressor located below food compartment. Compressor Model No. H-6—twin cylinder, 1740 r.p.m., 1 1/16-in bore, 1 1/16-in. stroke. Refrigerant, sulphur dioxide. Lubricant, Sunoco. No shaft seal.

CABINET

Made by Gibson. Wood and steel frame with Balsam Wool insulation, Panelyte breaker strip. Balloon-type rubber gasket.

HARDWARE

Made by Winters & Crampton and National Lock with chrome-plated finish.

MOTOR

Capacitor-start induction-run type made by Delco and General Electric. Permanently oiled.

CONDENSER

McCord and Chase Brass, fan cooled, finned coil condenser.

EVAPORATOR

Made by Gibson, copper plate and boiler type. Freezer shelf type on CB and SD models. High-side float refrigerant control. Anodic aluminum finish ice trays with ice tray release.

CONTROL

Ranco adjustable temperature control type KR and Tagliabue adjustable temperature control No. R-19 mounted inside the cabinet. Wide-cycle defrosting with vacation cycle. Automatic reset overload protector.

POLICY

Guarantee on cabinet: One year.
Guarantee on system: Five years.
Serviced by: Distributors and dealers.
Replacement parts are sold to independent service companies.

SPECIAL FEATURES

Interior light on all models; Stor-a-Space and Util-a-Rac on CB models.

*Ice melting effect per 24 hours with 20° evaporator.



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Your manufacturing costs can be kept down to a minimum in styling refrigerator hardware to harmonize with the appearance of your cabinet, if you will consult our staff of engineers as soon as you begin to consider cabinet designs for 1937.

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GRANDVILLE • • • MICHIGAN

Miss Taylor to Direct McCall Kitchen

NEW YORK CITY—Miss Demetria Taylor, formerly of the staff of Good Housekeeping Institute, was recently named head of the McCall Magazine Kitchen, reports Miss Elizabeth Woody, director of Foods and Appliances of McCall's.

Miss Taylor had been with Good Housekeeping eight years, the first three of which she spent in recipe organization, food testing, and preparation of food articles and recipe books. From 1932 until her resignation, she headed the department responsible for home-use tests on household products.

Her training in nutrition was received at the college of home economics of Syracuse university, where she received her bachelor of science degree, and at Columbia university where, after working with Dr. Grace MacLeod, Dr. Mary Swartz Rose, and Dr. Walter Eddy, she earned her master of arts degree in nutrition. Prior to her work on women's magazines, Miss Taylor taught food, nutrition, and cooking for three years.

3,755 Units Sold up to June 10 in 'Circus'

ATLANTA—With but 40% of the campaign period of the Georgia Power Co.'s current "Sales Circus," expended, reports to June 10 show that 3,755 units, 46.9% of the 8,000 unit quota, have already been sold.

This figure includes 2,228 refrigerators, 755 ranges, 522 water heaters, and 250 commercial and air-conditioning installations.

Augusta, with 549 unit sales, or 54.44% of quota, is the leading division, the Rome division in second place with 425 units, or 50.36% of quota.

Two things make for lasting success: quality of product and aggressive selling.

You may have the latter—and you may have the former. But if the merit of your product is hidden by the unsightly appearance that soon results from a comparatively soft finish—you have a hard time convincing the buying public that quality was there even at the start.



PORCELAIN ENAMEL INSTITUTE, INC.
612 NORTH MICHIGAN AVENUE, CHICAGO

PORCELAIN ENAMEL

Meacham & Schweller Discuss Improvements Required for Shell-Type Porcelain Unit

SKYTOP, Pa.—Problems and experimental findings in the development of frameless or "shell" type porcelain enameled electric refrigerator cabinets were outlined by F. L. Meacham and E. F. Schweller of Frigidaire Corp. at the final technical session of the A.S.R.E. convention here last week.

Improvements in Manufacture

The authors then pointed out some of the improvements in manufacturing and processing methods brought about by the demand.

In order to take advantage of the desirable features of a shell type cabinet and to produce this cabinet in a porcelain enamel finish, a development program on both materials and mechanical design was undertaken, it was pointed out. This program covered development work on porcelain enamel ground coats, porcelain enamel white coats, enameling sheet metal and a study of designs which could be satisfactorily enameled.

Problems which were apparent in enamel ground coats, and on which development work was necessary, were to develop ground coats which could be applied at lower temperatures and with a wider range of firing times and temperatures and which would be less susceptible to other enameling defects such as fish scaling, copper heading and boiling.

Problems with Cover Coat

Porcelain enamel cover coats were lacking in covering power or opacity. Enameling sheet metal was prone to sag and warp during the enameling operation. Also, it was found highly desirable to condition the surface of the sheet properly in order to secure better bonding properties of the ground coat to the base metal.

So far as mechanical design was concerned certain inherent defects in the regular shell type of construction were apparent. It was necessary to study these in order to make this type of construction successful in porcelain enamel.

Changes in Enamel Consistency

Porcelain enamel sources were able to reverse the enamel composition so that the ground coat enamels retained their resistance to the copper heading tendency and at the same time fired at lower temperatures. Consequently during 1933 enamel ground coat firing temperatures were reduced to around 1560° F., which is about the average temperature used today.

This copper heading condition is one of excessive local oxidation of the base metal. The excessive oxide is absorbed by the ground coat in the firing operation. In absorbing the iron oxide the physical properties of the enamel are destroyed so that a ground coat defect in the form of either a pit or a copper-colored raised area results. These defects are particularly difficult and often impossible to cover with the white enamel cover coats.

Effect of Higher Temperatures

At temperatures of around 1600° F. decided distortion of porcelain enamel parts takes place due not only to warpage but also to sagging of the base metal. An increase in temperature by as much as 10° F. makes the condition decidedly worse, conversely a reduction in temperature of 10° F. makes the condition decidedly better. Therefore the reduction of ground coat firing temperatures to 1560° F. has helped greatly in controlling the shape of porcelain enamel ware coming from a ground coat furnace.

In this connection there has also been considerable improvement made in the sag resistance of enameling iron. In the early days of the porcelain enameling art the enameling operations were carried out in box type furnaces. In this type of operation the ware was supported from underneath on a series of burning bars which gave generous support to the part being processed.

Methods of Support Changed

When the continuous porcelain enameling furnace came into use the method of supporting the ware was to hang it from hooks travelling on an overhead conveyor.

Naturally this resulted in rather large unsupported areas, together with increased load per support. This condition exaggerated the sagging tendency of the enameling irons then in use and which had been considered satisfactory in the box type furnace.

It was quickly realized that definite improvement was needed if the continuous furnace operations were to be successful. In order to study this condition properly a means of testing the sagging properties of enameling iron was developed. As a result of work done on this test the steel mills were able to improve the physical prop-

ties of enameling iron to the point where the sagging tendency was reduced to one-third or less of what it had previously been.

Better Bonding Secured

Better bonding of porcelain enamel ground coats to the base metal was obtained through reformulation of enamel ground coats and by proper preparation of the sheet metal surface. It was found that a chemically roughened surface widened the bonding range of any given enamel to a remarkable extent, whereas mechanical roughening of the sheet surface, with the exception of sand blasting, would not improve the bonding range.

Other porcelain enamel ground coat defects which were apparent, and needed improvement, said the authors, were those of fish scaling and boiling.

Fracture in Enamel Surface

The fish scaling phenomenon is one which results from poor bond between the ground coat and the enameling iron. When the ground coat is not properly bonded to the base metal the compression strains which are set up in the enamel on cooling cause the enamel to fracture in a conical shape.

This fracture proceeds from the base metal out to the surface of the porcelain enamel, the fracture having the appearance of a fish scale.

Since this defect is one of bond between the enamel and the base metal the problems discussed above relative to bond between the enamel and the base metal have practically eliminated this defect.

The boiling of a ground coat results in particles of the ground coat enamel migrating into the white coats while they are being fired. This is a very undesirable feature of ground coats since it causes excessive reoperations

in order to secure ware free from black specks. So far as this troublesome feature of ground coats is concerned it has been practically overcome in recent ground coat formulas.

It has been definitely proved, said the authors, that the most durable porcelain enameled ware is that to which the least amount of porcelain enamel is applied. This is particularly true when resistance to chipping is considered. The thicker the enamel the less distortion is possible without fracture of the enamel.

Improvement in Opacity

Recent attempts by the enamel manufacturing companies have resulted in the development of enamels with decidedly improved opacity and at the same time they have maintained the workability of enamels with lower opacity. The use of these enamels has naturally resulted in a reduction of the amount of enamel which has been applied. From 1927 to 1936 the opacity of white enamels has increased from 70 to 77%.

Along with the material development necessary to produce a shell type refrigerator cabinet, the mechanical design of a cabinet which would permit successful porcelain enameling needed considerable development, the authors declared.

Defects Found in Test

Starting with the shell type cabinet which was being produced in an organic finish, experiments were begun with the porcelain enameling operations. After enameling the regular shell type cabinet certain defects were found at the following places:

(1) In this structure the insulation bottom was spot-welded to the vertical walls of the cabinet. This spot welding caused excessive warping between the welds which produced an appearance similar to a stitched surface. It also was the cause of hair lining.

Hair lining is a porcelain enamel defect caused by a fracture in the dried white enamel film which takes place before fusion of the enamel. As a result of this fracture the fired white enamel contains a black streak at the point of fracture due to the ground coat appearing in the fractured area.

Trouble Due to Welding

(2) An angle iron base frame was welded to the vertical walls at the bottom of the shell. This angle iron base frame, due to variation in thickness, caused excessive unequal heating and cooling. Hair lines and a bulged condition resulted at the spot welds.

Solution of the difficulty at the bottom of the insulation compartment resolved itself into a design where no horizontal tie existed between the vertical walls. This was accomplished by an inner shell welded to the base flanges of the cabinet.

This might better be illustrated by saying that the inner shell telescopes into the larger shell from the bottom, and is welded to the base of the outer shell. A double-folded flange at the bottom made possible a rigid base.

Improvement in Structure

The inner shell welded to the base gave a triple thickness of metal at the bottom flanges. This permitted doing away with the angle iron frame in the burning operations, and at the same time gave a rigid base so that no distortion occurred in heating.

This structure showed promise, the authors related, and a number of them were then enameled. The only difficulty experienced with these was a hair line condition at the bottom corners. Various corners, welded and open, were made. Models, after firing, indicated that a securely torch-welded corner, with the weld being away from the exposed surface, overcame this defect. This structure was satisfactory with regard to proper enameling characteristics.

Other Weaknesses Found

In checking the structure for handling and assembling, weaknesses were indicated around the door opening corners and at the rear bottom flange.

The door opening corner was strengthened by the addition of a reinforcement welded in place and also by wiping the finish coats from the flange. The weakness in the rear corner was solved by bracing this member and forming a stiffening flange from the corner to the back panel.

Among the advantages claimed by the authors for the porcelain enamel shell over previous types of porcelain

enamel cabinet construction are the following:

(a) Numerous piece parts have been eliminated and control and processing of materials is simplified.

(b) Color matching of parts assembled on the same cabinet has been simplified since the number of these parts has been materially reduced.

(c) Production scrap has been reduced by 82% over that which was obtained in the same shop with the panel type of porcelain enamel cabinet construction. Also, the reoperations necessary in order to secure satisfactory porcelain ware have been reduced by 23%. One of the main reasons for the reduction in these scrap figures is that the cabinet is enameled in essentially one piece which avoids the necessity of mounting a large number of parts, and thus inducing strains in the porcelain enamel parts since these panels are seldom entirely flat and accurate in dimension.

(d) A marked improvement in sealing the insulation has resulted since the cabinet structure is essentially one piece of metal. The accumulation of moisture in the insulation has been eliminated.

(e) Interior sweating of refrigerator cabinets has been reduced since by the elimination of the panel joints better food compartment sealing has been obtained.

(f) A distinct forward step in beauty and style has been accomplished.

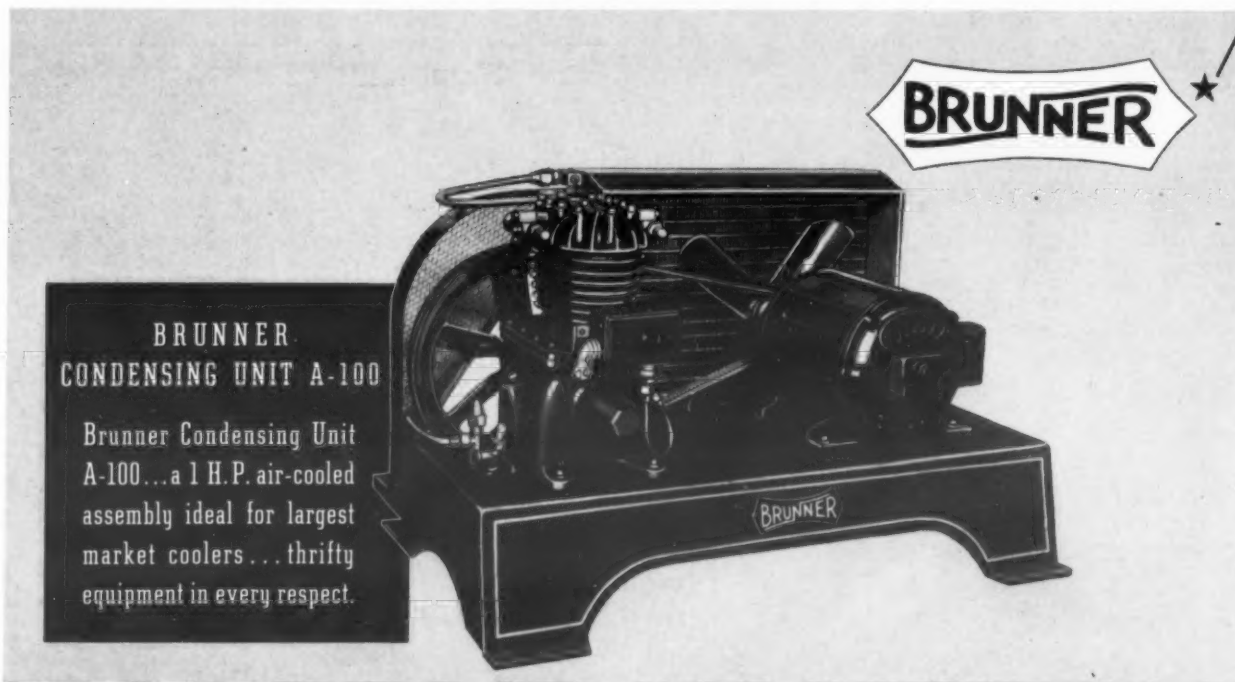
39 Louisville & Nashville Railroad Coaches to Be Conditioned

BIRMINGHAM, Ala. — Approximately \$330,000 is being spent by the Louisville & Nashville railroad in the air conditioning of 39 day coaches for use on several of its better trains.

Three of the coaches were completed and placed in service the last week in May. It is expected that 14 of the remaining 36 will be ready for the rails in June, and 22 in July.

The coaches will run on Cincinnati-New Orleans and Chicago-Florida lines.

REFRIGERATION UNITS, TOO, HAVE THEIR *Hall Mark*



So sterling a record for dependability have Brunner Refrigeration and Air Conditioning Units built up in almost every phase of the industry that more and more is the name "Brunner" recognized as an official stamp of quality. And to back up this reputation is a sales record which is truly phenomenal! Check through the well-balanced list of Brunner features—you'll see at a glance why Brunner offers so much more for

every dollar invested: sturdy, compact assembly... quiet, vibrationless operation... untiring efficiency—and all at low power input! Brunner offers equipment for all applications requiring from 100 lbs. to 15 tons of refrigeration—forty-seven condensing units, five compressor models from 1/4 H.P. to 15 H.P., air and water cooled. Full particulars gladly sent on request. BRUNNER MANUFACTURING CO., UTICA, N. Y., U. S. A.

BRUNNER CONDENSING UNITS and COMPRESSORS

KELVINATOR

Kelvinator Corp., Detroit, Mich.

Model No.	K3-36	KS5-36	KS6-36	K4-36	K5-36	K6-36	K7-36	PK5-36	PK6-36	PK7-36	SD7-36	SD9-36	SD13-36	SD17-36
Compressor Model No.	A9116D	A9116D	B9116D	A9116D	A9116D	B9116D	B9116D	A9116D	B9116D	B9116D	B9116E	B9125G	B9125H	B9125H
PRICE														
Retail price, installed	\$104.50	\$144.50	\$164.50	\$129.50	\$164.50	\$189.50	\$219.50	\$184.50	\$209.50	\$249.50	\$324.50	\$385.50	\$534.50	\$684.50
Cabinet finish, exterior	Dulux							Porcelain						
CABINET DIMENSIONS														
Overall height (inches)	45½	54½	57	49½	55½	58½	61	56	58½	61½	61½	66½	66½	73½
Overall width (inches)	24	27½	29½	24	28½	29½	32½	28½	29½	32½	32½	34½	48	50½
Overall depth (inches)	25	26½	26½	25½	26½	26½	26½	26½	26½	26½	26½	28½	29	29
Inside height (inches)	19½	27½	30½	24½	27½	30½	32½	27½	30½	32½	24½	30	35½	42½
Inside width (inches)	18½	20½	22½	18½	20½	22½	24½	20½	22½	24½	21	26½	27½	29½
Inside depth (inches)	17	17	17	17	17	17	17	17	17	17	18½	18½	18½	18½
Number of doors	1												2	2
STORAGE CAPACITY														
Net food storage (cu. ft.)	3.16	5.25	6.17	4.15	5.16	6.16	7.18	5.16	6.16	7.18	7.04	9.20	13.12	16.79
Number of shelves	4	5	5	5	5	5	5	5	5	5	4	5	5	7
Total shelf area (sq. ft.)	8.12	12.01	13.17	10.37	12.06	12.79	14.81	12.06	12.79	14.81	13.80	18.51	25.92	31.86
Cabinet finish (interior)	Porcelain													
INSULATION														
Top (thickness in inches)	3½	3½	3½	3½	4½	5	5½	3½	3½	4	4	4½	5	5
Sides	2½	3½	3½	2½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
Back	2½	3½	3½	2½	3½	3½	3½	3½	3½	3½	4	4	3½	3½
Door	3½	2½	2½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
Bottom	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
ICE CUBES														
Number of shallow trays	2	3	3	2	4	4	6	4	4	6	4	4	8	10
Number of deep trays	0	0	0	0	1	1	1	1	1	1	2	2	2	2
Total number of cubes	42	63	81	40	80	80	120	80	80	120	176	187	240	280
Total weight of cubes (lbs.)	4	6.75	10.5	4.5	9	9	13.5	9	9	13.5	21	23.5	26	30.5
COMPRESSOR														
Ice melting effect 24 hrs. (lbs.)	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/4	1/4	1/4
Motor horsepower	24	35	36	33	35	33	36	35	33	36	31	31	38	44
Refrigerant in system (oz.)	19	19	24	19	19	24	24	19	24	24	24	24	24	24
Quantity of lubricant (oz.)	31½												47½	47½
Belt circumference (inches)	38												48	48
Belt width (64ths of an inch)														
WEIGHT														
Net weight (lbs.)	227	273	293	248	286	319	331	336	358	377	442	497	674	745
Shipping weight (lbs.)														

*G.S.—General storage; F.S.—frozen storage compartment.

COMPRESSOR

Made by Kelvinator, open, reciprocating, belt-driven compressor located below food compartment. Shaft seal, bellows.

Compressor Model No. A9116D, B9125G—twin cylinder, 525 r.p.m., 1¼-in. bore, 1½-in. stroke.

Compressor Model No. B9116D—single cylinder, 410 r.p.m., 1¼-in. bore, 1½-in. stroke.

Compressor Model No. B9116E—twin cylinder, 410 r.p.m., 1¼-in. bore, 1½-in. stroke.

Compressor Model No. B9125H—twin cylinder, 640 r.p.m., 1½-in. bore, 1½-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, Kelvinator.

CABINET

Made by Kelvinator, steel and wood frame with Kelvinator insulation, Kelvalyte (composition bakelite) breaker strip, rubber balloon-type gasket.

HARDWARE

Made by Kelvinator. Chrome finish, white ivory trim on all but K3-36, KS5-36, KS6-36.

MOTOR

Condenser start-induction run type made by Emerson and Delco. Oil every 3 months.

CONDENSER

Kelvinator fan cooled, continuous fin and tube condenser.

EVAPORATOR

Made by Kelvinator of Armco iron, porcelain on steel. High side float refrigerant control. Anodic aluminum ice trays. Rubber grids in all trays.

CONTROL

Ranco adjustable temperature control. Model KR on PK, K, and KS units; KJ on SD units; mounted inside the cabinet. KR has semi-automatic defrosting with vacation cycle, KJ has manual defrosting (no defrosting necessary in food compartment). Current and temperature (Fusetron) overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One-year warranty, plus four-year Protection Plan, providing for free replacement of any necessary compressor mechanism. Serviced by: Dealers only.

SPECIAL FEATURES

All Models—Welded steel cabinet; bar-type shelves; rubber shelf supports; glass defrosting tray.

Additional Features of Various Models—Automatic interior light (except model K3-36); vegetable crisper with serving tray cover of black bakelite (porcelain crisper top on models KS5-36 and KS6-36; no crisper on model K3-36); built-in thermometer (except on model K3-36); utility basket (except on model K3-36, accessory on models KS5-36 and KS6-36); sliding shelf, extra double-depth tray, and sorting tray—models K5-36, K6-36, K7-36, PK5-36, PK6-36, and PK7-36; ice tray release (except on models K3-36, K4-36, KS5-36, and KS6-36); refrigerated shelf—models K7-36 and PK7-36 only.

SD Model Features—(besides those of K and PK models with exceptions noted)—Two-temperature cabinet with two separately insulated one-piece porcelain chambers for food storage and freezing; non-frosting cooling unit in food compartment; forced air circulation; air purifier and deodorizer; sorting tray; vegetable drawer with crisper, utility basket (models SD7-36 and SD9-36); utility drawer (models SD13-36 and SD17-36 only); thrift drawer with three china dishes; covered china mixing bowl and refrigerated rolling pin; water pitcher; fast-freezing on all ice tray shelves; dry cube trays.

NORGE

Norge Division, Borg-Warner Corp., Detroit, Mich.

		Economy models						Deluxe models											
Model No.		T-20-6	S-31-6	E-32-6	E-42-6	E-52-6	E-62-6	L-42-6	L-52-6	L-62-6	L-72-6	L-82-6	P-42-6	P-52-6	P-62-6	P-72-6	P-82-6	P-95-6	P-112-6
Compressor Model No.		ACC400B																	
PRICE																			
Retail price, installed																			
Cabinet finish, exterior		Synthetic enamel*										Porcelain							
*Models T-20-6 and S-31-6 have exterior top of porcelain.																			
CABINET DIMENSIONS																			
Overall height (inches)	36	35½	48	52½	55½	60½	52½	55½	57½	59½	62	52½	55½	57½	59½	62	60½	60½	
Overall width (inches)	22½	24	24½	24½	27	29½	27½	28	30	32½	35	27½	28	30	32½	35	40½	48½	
Overall depth, cabinet only (inches)	19½	21½	20½	21½	23½	24	22½	24½	24½	24½	24½	22½	24½	24½	24½	24½	25½	25½	
Inside height (inches)	15½	17½	21	25½	27½	31½	25½	27½	29½	31	32½	25½	27½	29½	31	32½	31½	31½	
Inside width (inches)	19½	20½	19½	19½	21	21½	19½	20½	22½	24½	27½	19½	20½	22½	24½	27½	33	40¾	
Inside depth (inches)	15½	17½	15½	16½	17½	17½	16½	17½	17½	17½	17½	16½	17½	17½	17½	17½	17½	17½	
Number of doors	1																2	2	
STORAGE CAPACITY																			
Net food storage (cu. ft.)	2.00	3.10	3.25	4.25	5.25	6.25	4.25	5.22	6.22	7.25	8.25	4.25	5.22	6.22	7.25	8.25	9.53	11.17	
Number of shelves	2	2	3	3	3	4	3	3	4	4	4	3	3	4	4	4	6	6	
Total shelf area (sq. ft.)	5.25	7.00	8.05	8.50	10.23	13.05	8.46	10.01	12.62	13.36	15.56	8.46	10.01	12.62	13.36	15.56	19.51	23.11	
Cabinet finish (interior)	Porcelain																		
INSULATION																			
Top (thickness in inches)																			
Sides																			
Back																			
Door																			
Bottom																			
ICE CUBES																			
Number of shallow trays	2				3	3	2	3	2	2	3	2	3	2	2	3	3	6	
Number of deep trays	0								1	1	1	0	0	1					
Total number of cubes	36	42	42	42	63	63	48	72	96	96	120	48	72	96	96	120	120	192	
Total weight of cubes (lbs.)	2½	4½	4½	4½	6½	6½	4½	7½	9½	9½	12½	4½	7½	9½	9½	12½	12½	20½	
COMPRESSOR																			
Ice melting effect 24 hrs. (lbs.)																			
Motor horsepower	1/6	1/6	1/6	1/6	1/6	1/5	1/6	1/6	1/5	1/5	1/4	1/6	1/6	1/5	1/5	1/4	1/4	1/4	
Compressor speed (r.p.m.)	550	550	550	550	550	625	550	550	625	625	700	550	550	625	625	700	800	800	
Refrigerant in system (oz.)																			
Quantity of lubricant ()																			
Belt circumference (inches)	33½				31½	33½	33½	33½	31½	31½	24	33½	33½	31½	31½	34	31½	31½	
Belt width (64ths of an inch)	26																		
WEIGHT																			
Net weight (lbs.)	200	220	225	250	270	325	290	315	340	370	410	300	325	355	385	450	475	560	
Shipping weight (lbs.)																			

COMPRESSOR

Commercial Uses

Application of Unit Coolers in Breweries Told by Jones At A.S.R.E. Meeting

SKYTOP, Pa.—Unit coolers of the surface or spray type for air-conditioning applications in the starting, fermenting and various types of stock and work rooms of medium-sized breweries were described by Walter Jones of Carrier Engineering Corp. at the first technical session of the A.S.R.E. meetings here last week.

Although innovations are being introduced with new construction some of which can be best treated with central-station type of equipment, Mr. Jones declared that for the general run of breweries satisfactory conditions have been accomplished with unit cooler equipment.

Where required, he explained, as in fermenting rooms, these unit coolers, combined with heating elements and provision to take in outside air, can be arranged to bring under adequate control all factors involved in a true air-conditioning application.

Used by Many Breweries

The list of breweries which are now at least partially equipped with unit coolers for stock rooms, unitary air conditioners for fermenting rooms, and, in a few cases, central station type of air conditioners for both fermenting rooms and stock rooms is a rapidly growing one.

"This equipment," Mr. Jones stated, "is being used because there is a need, and there always has been a need, for some measure of control, in varying degree, of humidity, air motion and air purity, as well as temperature, in all low temperature rooms. The brewery may be compared to the bakery or the milk plant in its need for sanitation in all phases of the manufacturing process and throughout the entire plant."

Importance of Sterile Conditions

"In the brewery, however, the requirement for sterile conditions is considered of more than ordinary importance because of the susceptibility to infection of the materials handled, and also because of the long time required for processing, aging, and storage."

"The product must possess zest and brilliance, have a fine creamy foam when drawn or poured and, of course, a pleasing taste. To produce this result, many factors must be under control at all times, including quality of raw materials, the mashing and brewing method, the fermentation cycle, aging and storage, sterility, controlled cooling, air conditioning and ventilation," Mr. Jones told his audience.

Application in Starting Room

Describing the brewery processes in relation to the refrigeration problem, Mr. Jones explained that in the starting room, if one is used, the wort which has been cooled, usually to 45° F. for lager and 55° F. for ale, is collected in open tanks, pitched with yeast and fermentation started. After a day or two in the starting room, it is passed to open tanks in the fermenting room where the fermentation process, requiring several days, is completed. During this process the maltose is converted, by enzymic action, into alcohol and CO₂ gas which passes off from the top of the tank into the room. This chemical action is accompanied by the generation of heat which is partially absorbed by a rise in temperature of the wort.

"Since the room temperature is maintained at a lower value than the wort temperature, part of the heat

passes through the walls and top of the tank into the room and is absorbed by the room cooling unit," the speaker said. "The temperature rise of the fermenting wort must be controlled during the fermenting period and this is done by means of attenuator coils in the tanks, which absorb the remainder of the heat that is not accounted for by rise in temperature and transmission to the room."

Determination of Heat Generated

"The amount of heat generated during fermentation is not at a constant rate insofar as any one tank is concerned, but may be considered constant, as determined from the brewing rate, for the multiplicity of tanks in the room as a whole."

"Like the heat of fermentation, the rate of CO₂ generation," he further explained, "is directly related to the pounds of maltose converted per barrel and the brewing rate. To keep the CO₂ concentration from building up to a dangerous percentage, a constant quantity of outside air must be introduced into the room for ventilation and a corresponding amount released."

Tanks Cleaned for Next Batch

"After fermentation is completed in a tank, the beer or ale is 'let down' through beer coolers into stock room tanks, according to discussion of the process. As a fermentation tank is emptied, the yeast is either skimmed off the top (top fermentation for ale) or shoveled out of the bottom (bottom fermentation for lager.) This yeast has multiplied greatly during fermentation, so a constant, in fact excess, supply is always at hand provided the yeast is not contaminated or infected. Much of it is spilled and must be washed down the drains. The tanks which are emptied each day are thoroughly washed and the floors hosed down. After a thorough cleaning, the tanks are again filled and the process repeated."

"The copious use of wash water, combined with the saturated CO₂ vapors from the tank tops, tends to maintain an atmosphere of high humidity, which would result in condensation on ceilings, propagation of mold growth and other unsanitary conditions if the room were not properly conditioned," he maintained.

Humidity Control Demanded

In applying refrigeration to such a room, Mr. Jones stated that the modern brewer, having in mind the need for sanitary conditions, demands not only temperature control but dehumidification or humidity control as well. He requires further that this control be maintained at all seasons—winter as well as summer. If the summer condition, with its comparatively high input of sensible heat from outside, is the sole consideration and only refrigeration equipment is applied, then temperature control only is possible. The refrigeration apparatus has the proper capacity to absorb total heat with its summer time ratio of latent and sensible heats.

"In the winter time," according to Mr. Jones, "the latent heat demand may be nearly equal to that for the summer time, but the sensible heat load is entirely lacking or may be an actual minus quantity."

"This is particularly true," he said, "of ale rooms maintained at 55° F. Dehumidification cannot be done without sensible heat cooling and since sensible heat input is not present in the proper ratio, the refrigerating

apparatus cannot operate without depressing temperatures below those desirable. Consequently, it does not operate at all or long enough to take care of the latent heat load, with the result that the air in the room attains a dewpoint considerably higher than the surfaces in these spaces, resulting in a wet condition."

Proposed Remedy

The remedy suggested by the speaker is to supply sensible heat in the amount necessary to bring the ratio of sensible heat to total heat in step with the amount of dehumidification which is required. The amount of sensible heat addition required during the winter season may at times equal the summer load, thus giving winter peak requirements as high as summer requirements.

The further possibility that the maximum summer time sensible heat input to the room from the various normal sources may not be sufficient to provide for the dehumidification requirement, was considered by the speaker.

This will certainly be the case when the fermentation room is surrounded by other rooms of equally low or lower temperatures. In selecting the cooling apparatus for the fermentation room, a careful estimate must be made of latent heat and sensible heat requirements and the capacity based on the maximum sensible heat cooling or maximum dehumidification requirement, whichever is greater. In the latter case, heat must be applied for both winter and summer operation. In selecting the room heating equipment, the capacity requirement must be based on the winter condition when the heating demand is at a maximum.

In the application of unit conditioners to large fermentation rooms where the outside air requirement for CO₂ ventilation is large, Mr. Jones claims that it is advantageous to select equipment for this duty which is independent of the room condition-

ing equipment. It is important, he said, particularly in congested sections, that the outside air be washed as well as filtered to eliminate the dust and bacteria. This indicates the use of a spray unit for this duty, having the refrigerating capacity necessary to cool the outside air from the maximum summer wet bulb to room wet bulb.

Use of Water Spray

Since the temperature requirement of the room is comparatively high, Mr. Jones believes that a water spray can be used provided the refrigerant temperature can be maintained high enough to prevent icing of the coils. Under extreme winter conditions, no refrigeration of outside air is required, but, on the contrary, a preheater is needed to prevent any possibility of freezing of the sprays.

"The maximum outside air cooling in summer is through a wide range in temperature, which results in a tonnage requirement which is out of balance with the c.f.m. of outside air for standard equipment."

Regulation of Outside Air

"It is therefore necessary, he continued, to regulate the outside air by dampering to the required amount. Another arrangement is to recirculate room air along with the outside air. When this arrangement is used, the proportion of recirculated air is usually 70 to 80% of the total air. If the requirements are relaxed and a surface unit without spray is permitted, then recirculation is necessary because of the comparatively high by-pass effect of the surface unit."

"As the primary duty of the outside air unit is ventilation of CO₂, it is arranged to operate continuously. During summer operation, when the outside air is dehumidified, the water condensed passes out of the unit through the overflow. At times during winter operation, the air is unavoidably humidified and the necessary

supply of water is maintained by use of a float valve."

The fans and spray pump are controlled manually and should operate continuously, according to Mr. Jones' experience. Assuming NH₃ as the refrigerant, he said the air temperature control is by means of a thermostat actuating a solenoid stop valve in the suction line. As refrigerant temperature control may also be necessary to prevent icing of the sprays, this can be done with a back pressure valve, pilot operated, with solenoid combined with it in the pilot line.

Application of Dry Coil Type

The room cooling and dehumidifying unit or units, Mr. Jones has found, are preferably of the dry coil type. With the protection of the outside air unit, which not only washes the outside air admitted but also protects against infiltration, the room units need not be of the spray type. Frosting is avoided by control of refrigerant temperature with back pressure valve. If more than one unit is indicated, they may be grouped to form one central station unit or separated to get better air distribution without the use of ducts.

Air distribution may or may not be critical, depending on the arrangement and dimensions of the rooms with respect to the tank arrangement and dimensions, he claims. It has been his experience that most brewmasters will not permit noticeable agitation of air over the open fermenting tanks. This very often rules out the possibility of air distribution over the top because of beam interferences and lack of height.

"Fortunately," he said, "it is the practice to elevate tanks above the floor and, in some instances, to use catwalks, which really makes a two-story room with the tanks extending through both stories. It is also the practice in this case to allow a 2- or 3-in. open space around the tanks."

(Concluded on Page 17, Column 1)



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Commercial Condensing Units



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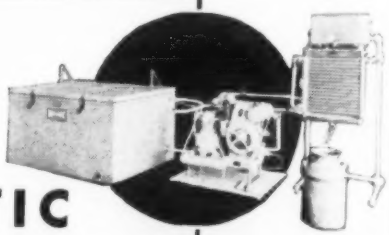


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"ICE-O-MATIC pays for itself," say dairymen, "in saving milk from souring and allowing us to get a premium for our milk. Saves hours of drudgery too." Ice-O-Matic comes in all sizes to fit every need. Gasoline or electric drive. Write for complete information.



WILLIAMS OIL-O-MATIC HEATING CORP.

World's Largest Specialists in Temperature Control

Dept. 723, Bloomington, Illinois

GILFILLAN

Gilfillan Bros., Inc., Los Angeles, Calif.

Model No.	S65	S67	I66	D67	D610
Compressor Model No.	D	E	E	E	E
PRICE					
Retail price, installed	\$109.50	\$154.50	\$149.50	\$194.50	\$269.50
Cabinet finish, exterior	Dulux				

CABINET DIMENSIONS

Overall height (inches)	53½	58½	60	65½	71
Overall width (inches)	23½	30	26½	30	33
Overall depth (inches)	21½	24½	23	24	24
Inside height (inches)	26½	31	30	34	39½
Inside width (inches)	19½	23½	22½	23½	26½
Inside depth (inches)	15½	17½	16	16	16
Number of doors	1				

STORAGE CAPACITY

Net food storage (cu. ft.)	4.0	6.5	5.33	6.8	9.0
Number of shelves	4	6	6	7	6
Total shelf area (sq. ft.)	9.1	13.5	13.6	14.33	18.16
Cabinet finish (interior)	Porcelain				

INSULATION

Top (thickness in inches)	2½	2½	2½	3	3
Sides	2	3	2½	3	3
Back	2	3	2½	3	3
Door	2½	3	2½	3	3
Bottom	2½	3	3	3	3

ICE CUBES

Number of shallow trays	2	3	3	2	2
Number of deep trays	0	0	0	1	2
Total number of cubes	56	84	84	112	168
Total weight of cubes (lbs.)	5	7½	7½	10	15

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	135	175	175	175	175
Motor horsepower	1/6	1/5	1/5	1/5	1/5
Refrigerant in system (oz.)	3½	3½	3½	3½	3½
Quantity of lubricant (oz.)	16	16	16	16	16
Belt circumference (inches)	34	34	34	34	34
Belt width (64ths of an inch)	32	32	32	32	32

WEIGHT

Net weight (lbs.)	280	370	370	430	530
Shipping weight (lbs.)					

COMPRESSOR

Made by Gilfillan, open, reciprocating horizontally opposed, belt-driven compressor located below food compartment. Shaft seal, Gilfillan rotary.

Compressor Model No. D—twin cylinder, 575 r.p.m., 1½-in. bore, 1½-in. stroke.

Compressor Model No. E—twin cylinder, 575 r.p.m., 1½-in. bore, 1½-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, Sinclair.

CABINET

Made by Seeger. Sitka spruce frame with Balsam Wool package insulation, Textolite breaker strip, Miller cushion rubber gasket.

HARDWARE

Made by National Lock Co. Polished-chromium finish.

MOTOR

Capacitor type made by General Electric. Oil annually.

CONDENSER

Bush, fan cooled, double row finned radiator condenser.

EVAPORATOR

Made by Gilfillan of copper and brass, continuous tube figure eight.

Mayson automatic expansion valve refrigerant control.

Aluminum and rubber ice trays. Alumilite fin.

CONTROL

Cutler-Hammer and General Electric adjustable temperature control, mounted inside the cabinet. Manual and wide-cycle defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year. Optional additional four years on condensing system for \$5.00 additional.

Serviced by: Gilfillan or authorized service company.

Replacement parts are not sold to independent service companies.

SPECIAL FEATURES

No repairs in home—units exchanged for factory-tested units or assemblies. (Discharge valves installed in heads.)

STEWART-WARNER

Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.

Model No.	456	556	656	566	666	766	866	666P	766P	866P
Compressor Model No.	86100	86200	86200	86200	86200	86200	86200	86200	86200	86200
PRICE										
Retail price, factory list	\$119.50	\$159.50	\$169.95	\$179.50	\$189.50	\$204.50	\$229.50	\$209.50	\$229.50	\$259.50
Cabinet finish, exterior	Dulux							Porcelain		

CABINET DIMENSIONS

Overall height (inches)	51½	54	57½	54	57½	61½	64½	57½	61½	64½
Overall width (inches)	23½	28½	28½	28½	28½	31½	31½	28½	31½	31½
Overall depth (inches)	21½	23	23	23	23	24½	24½	23½	24½	24½
Inside height (inches)	27½	28½	32½	28½	32½	35	37½	32½	35	37½
Inside width (inches)	19½	22½	22½	22½	22½	24	24	22½	24	24
Inside depth (inches)	16	16½	16½	16½	16½	16½	16½	16½	16½	16½
Number of doors	1									

STORAGE CAPACITY

Net food storage (cu. ft.)	4.5	5.5	6.3	5.5	6.3	7.4	8.1	6.3	7.4	8.1
Number of shelves	5	6	8	6	8	8	7	8	8	7
Total shelf area (sq. ft.)	10.2	13.3	14.8	13.3	14.8	16.5	17.7	14.8	16.5	17.7
Cabinet finish (interior)	Porcelain									

INSULATION

Top (thickness in inches)	2	3	3	3	3	3½	3½	3	3½	3½
Sides	2	3	3	3	3	3½	3½	3	3½	3½
Back	2	3	3	3	3	3½	3½	3	3½	3½
Door	2½	3	3	3	3	3½	3½	3	3½	3½
Bottom	2½	3	3	3	3	3½	3½	3	3½	3½

ICE CUBES

Number of shallow trays	2	4	4	4	4	6	6	4	6	6
Number of deep trays	Optional									
Total number of cubes	56	96	96	93	93	141	141	93	141	141
Total weight of cubes (lbs.)	4	8	8	8	8	12	12	8	12	12

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	93	155	155	155	155	155	155	155	155	155
Motor horsepower	1/6	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/5
Refrigerant in system (oz.)	72	80	80	80	80	80	80	80	80	80
Quantity of lubricant (oz.)	20	24	24	24	24	24	24	24	24	24
Belt circumference (inches)	37	39½	39½	39½	39½	39½	39½	39½	39½	39½
Belt width (64ths of an inch)	33	33	33	33	33	33	33	33	33	33

WEIGHT

Net weight (lbs.)	299	393	411	421	444	503	517	464	529	545
Shipping weight (lbs.)										

COMPRESSOR

Made by Stewart-Warner, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. 86100—single cylinder, 450 r.p.m., 1½-in. bore, 1-7/16-in. stroke.

Compressor Model No. 86200—twin cylinder, 375 r.p.m., 1½-in. bore, 1-7/16-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, white oil (Socony Vacuum—80 to 90 vis). Shaft seal, Fulton bellows seal.

CABINET

Made by Stewart-Warner or Rex Mfg. Co. Wood and steel frame with Balsam Wool insulation, Tylac breaker strip, Miller rubber gasket.

HARDWARE

Made by S-W, Winters & Crampton, and Grand Rapids Brass with bright chromium finish.

MOTOR

Capacitor start motor made by Delco or General Electric.

Oil once a year.

CONDENSER

Made by Bush Mfg. Co., fan cooled, finned tube condenser.

EVAPORATOR

Mullins Mfg. Co. (Stewart-Warner design), porcelain on pressed steel shell. Low side float refrigerant control, Stewart-Warner expansion valve. Anodized aluminum ice trays. Flexo-tray (rubber); double-depth tray (optional).

CONTROL

Cutler-Hammer adjustable temperature control. Model S-W No. 86399 and 86410 (C-H bulletin No. 9502), mounted inside the cabinet. Manual and wide-cycle defrosting. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year; then four-year optional replacement contract on specified major parts for \$5.00 additional.

Serviced by: Distributors and dealers.

Replacement parts are sold to independent service companies, but usually through distributors.

SPECIAL FEATURES

Sav-a-Step, Slid-a-Tray, 11-point illuminated cold-control dial, Tilt-a-Shelf, and jumbo vegetable freshener and fruit basket.

LEONARD

Leonard Refrigerator Co., Detroit, Mich.

Model No.	LS5-36	LS6-36	L3-36	L4-36	L5-36	L6-36	L7-36	P5-36	P6-36	P7-36	P10-36
Compressor Model No.	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	B
PRICE											
Retail price, installed	\$144.50	\$164.50	\$104.50	\$129.50	\$164.50	\$189.50	\$219.50	\$184.50	\$209.50	\$249.50	\$379.50
Cabinet finish, exterior	Dulux							Porcelain			

CABINET DIMENSIONS

Overall height (inches)	54½	57½	45½	49½	55½	57½	62½	55½	57½	62½	64½
Overall width (inches)	27½	29½	24	24	29½	32½	32½	29½	32½	32½	40½
Overall depth (inches)	27½	27½	25½	25½	27½	27½	27½	27½	27½	27½	26½
Inside height (inches)	27½	30½	19½	24½	25½	27½	32½	25½	27½	32½	34½
Inside width (inches)	20½	22½	18½	18½	22½	24½	24½	22½	24½	24½	32½
Inside depth (inches)	17	17	17	17	17	17	17	17	17	17	17½
Number of doors	1										2

STORAGE CAPACITY

Net food storage (cu. ft.)	5.25	6.17	3.16	4.15	5.15	6.18	7.25	5.15	6.18	7.25	10.59
Number of shelves	5	4	5	5	5	5	6	5	5	6	6
Total shelf area (sq. ft.)	12.01	13.17	8.12	10.37	13.16	13.45	16.93	13.16	13.45	16.93	20.98
Cabinet finish (interior)	Porcelain										

INSULATION

Top (thickness in inches)	3¼	3¼	2½	2½	3¼	3¼	3¼	3¼	3¼	3¼	3¼
Sides	3¼	3¼	2½	2½	3¼	3¼	3¼	3¼	3¼	3¼	3¼
Back	3¼	3¼	2½	2½	3¼	3¼	3¼	3¼	3¼	3¼	3¼
Door	2½	2½	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3
Bottom	3¼	3¼	2½	2½	3¼	3¼	3¼	3¼	3¼	3¼	3¼

ICE CUBES

Number of shallow trays	3	3	2	2	3	3	4	3	3	4	4
Number of deep trays	0										1
Total number of cubes	63	81	32	40	72	72	96	75	75	99	147
Total wt. of cubes (lbs.)	6.75	10.5	4	4.5	10.5	10.5	14	10.5	10.5	14	20

COMPRESSOR

Ice melting effect 24 hrs.	..	..	..	..	..	..	..	..	..	..	..
Motor horsepower	1/8	..	..	..	..	..	1/6	1/8	1/8	1/6	1/4
Refrigerant in system (oz.)	27	28	22	26	28	28	30	28	28	30	48
Quantity of lubricant (oz.)	15										24
Belt circumference (ins.)	31½										
Belt width (64ths of inch.)	26										38

WEIGHT

Net weight (lbs.)	272	302	220	247	305	326	353	337	359	387	556
Shipping weight (lbs.)											

COMPRESSOR

Made by Leonard, open, reciprocating, belt-driven compressor located above food compartment, except on P10-36, which is below. Shaft seal, bellows.

Compressor Model No. SA—single cylinder, 560 r.p.m. (670 on models L7-36 and P7-36), 1¼-in. bore, 1-in. stroke.

Compressor Model No. B—twin cylinder, 410 r.p.m., 1¼-in. bore, 1-in. stroke.

Refrigerant, Freon (CCl₂F₂). Lubricant, Leonard oil.

CABINET

Made by Leonard. Steel and wood frame with Leonard insulation, composition bakelite breaker strip, balloon-type rubber gasket.

HARDWARE

Made by Leonard. Chrome-plated finish.

Jones Tells A.S.R.E. Members How Unit Coolers Can Be Applied to Various Operations in Modern Breweries

(Concluded from Page 15, Column 5)

"Advantage can be taken of this construction," he stated, "to use down draft conditioning units and distribute the air along the floor or in the lower space. The air returns to the unit over the tops of the tanks without disturbance to the surface of the fermenting wort."

The same general scheme of distribution, he avers, can be used when the starting room and fermenting room are grouped together with the starting room over the fermenting room. In this case, a temperature in the starting room 2 or 3° higher than the fermenting room is permitted. This allows for the temperature rise in the air as it first passes through the fermenting room and then through gratings up into the starting room.

'Down Draft' Conditioners

"Unit conditioners operating on the down draft principle, delivering and distributing the air at a low level, set up a positive air flow along the ceiling surface, and if this air is properly conditioned so that it has the necessary moisture deficiency, not only will it allow for complete diffusion of saturated vapors coming from the fermenting tanks, but, because its dewpoint is lower than the ceiling surface temperature, will not allow condensation to form on this surface," according to the speaker.

"Continuous fan operation of the conditioning units in fermenting rooms is desirable so that spot concentrations of CO₂ and high humidity air will not exist."

Wiring of Humidistat

"Keeping in mind," he said, "the dual purpose of the cooling unit and that it may be called on for dehumidification at times when the dry bulb temperature is sufficiently low, a humidistat is electrically connected in parallel with the refrigeration thermostat. Assuming steam as the source of heat, a modulating thermostat controls the flow of steam to the heater coil. With this combination of controls the cooling unit supplies automatically cooling or dehumidification as required."

"The heating thermostat calls for heat at the proper time and in required amount, because it is set to turn heat on at a temperature 1° below the point at which the refrigeration thermostat shuts off refrigeration. Thus heat is not called for except in response to the humidistat demand on the cooling unit. The heating thermostat turns heat off at a temperature 1° below the temperature at which the refrigeration thermostat calls for refrigeration. This setting prevents the heating unit competing with the refrigerating unit when dehumidification requirements are satisfied."

Humidistat Setting

The setting of the humidistat, Mr. Jones said, varies for different types of rooms. An average of 85% R.H. is usually the highest setting permissible, while 75% may be required in other cases. It is important that all three instruments be located in the upper section of the room and approximately together.

In practice he has found that the refrigeration thermostat does not control at any time during the winter season. The humidistat assumes complete control. During the summer season, the refrigeration thermostat assumes control, although there are occasions when the heating thermostat occasionally cuts in showing that even in this season the humidistat is active.

The yeast storage room was the next unit described by the speaker. "The yeast," he said, "is collected in tubs in the fermenting room and taken to the yeast storage where it is agitated to free the entrained CO₂ gas and allowed to assist in maintaining sterile and sanitary conditions. Further protection against infection and spoilage must be provided by maintenance of low temperature 32°-34°F. and by insuring that nothing but pure air can enter the room."

Protection Against Mold Formation

"Further protection against mold formation should be provided by adequate dehumidification and drying of the room. Essentially the same treatment that is provided for the fermentation room is indicated for the yeast storage except that simplification is possible and desirable. The room is comparatively small and can be conditioned by one unit for all services."

"During the day the product load is high, as it is during this period that the yeast tubs, at a temperature of 60°F.-70°F., are brought into the room. At this time there is also a copious use of wash water and the doors are opened and closed frequently. At night the room remains

closed, the product is finally cooled to room temperature and the room thoroughly dried."

Because of the combination of high latent heat load and low temperature requirement, the unit cooler best here, Mr. Jones has found, is of the brine spray type. "This unit," he declared, "is also equipped with a small outside air connection for CO₂ ventilation and to prevent infiltration. The amount of outside air given should be based on the amount needed to combat infiltration, as this amount will be entirely adequate for ventilating the small amount of CO₂ which is brought into the room with the yeast."

Drafts Must Be Avoided

Air distribution in this room is not critical, Mr. Jones declared, insofar as the product is concerned, but excessive drafts must be avoided because of the workmen. Ductless distribution can be obtained by a central location and overhead discharge in four directions. The fan and brine spray pump, he advised, should operate continuously and refrigeration control be provided by thermostat actuating a suction line solenoid valve. The refrigerant temperature need not be controlled unless it is so exceptionally low as to cause freezing of the brine spray.

"Humidity control is not required," he claims, "nor is it necessary to add heat in the winter season. This follows because the room temperature requirement is low and the product cooling load is a very high percentage of the total at all seasons. Adequate dehumidification is the natural result of the long hours of operation for product cooling. A preheater on the outside air can be dispensed with because of the small quantity and the use of brine spray. Air filters are, of course, required and a double bank is advisable for high efficiency of dust removal."

Stock Rooms

The essential requirements of the brewery stock room, the next room considered by the speaker, including the government cellar, are maintenance of a uniformly low temperature (30°F.-32°F. in some cases, 32°F.-34°F. as a rule) and adequate dehumidification.

The refrigeration load, he stated, here is primarily one of cold storage, as the incoming beer is previously cooled to room temperature in the beer cooler. If secondary fermentation is used, there may be heat leakage through the tanks to the room from this source and this load must be allowed for in selection of equipment. "It is always advisable, however," he warned, "to allow for some product cooling in the stock rooms. Occasionally the beer may not be cooled to room temperature, because of temporary maladjustment of the beer cooler, and the room coolers will be required to effect the final temperature reduction, by transfer of heat through the tank walls."

Variation in Heat Ratio

"The sensible heat ratio to total heat may vary through wide limits in these rooms. Ordinarily wash water is used freely every day and the percentage of latent heat is high. There may be periods in some stock rooms, however, when tanks are neither filled nor emptied and wash water is not used. At such times, rooms with steel tanks become almost bone-dry and the sensible heat ratio of operation is high. Since the capacity of unit coolers varies markedly with the sensible heat ratio, this condition, if present, should be allowed for."

Mr. Jones has discovered no great problem in air distribution in stock rooms when steel tanks are used. With wooden tanks, high velocities or excessive turbulence should be avoided at the top as drying out may occur when tanks are partially empty. In large rooms, a multiplicity of units may be advisable to get good distribution without resorting to the use of ducts.

Two Types of Units Used

"Both surface units and brine spray units are used; the spray unit being preferred when temperatures of 30°F.-32°F. are specified. With surface units," Mr. Jones says, "adequate allowance must be made for frost accumulation and it is advisable to provide for a reliable method of quick defrosting daily. Defrosting by shutting off refrigeration either manually or automatically and allowing the fan to operate is practical for rooms which are permitted to rise 3 or 4° above freezing, provided ample allowance is made for time out for defrosting."

Ventilation to combat infiltration is not considered necessary by the

speaker, nor is heat required to assist in dehumidification. Operating periods appear to him to be sufficiently long for temperature maintenance to keep the rooms reasonably dry at all seasons.

"Refrigeration is controlled by thermostat for off and on operation. In the case of direct expansion NH₃, the refrigerant flow is shut off by a solenoid stop valve in the suction line. Fans are shut down at the same time unless automatic defrosting using room air is a part of the control. In this case, Mr. Jones said, fans may continue to operate until defrosting is effected."

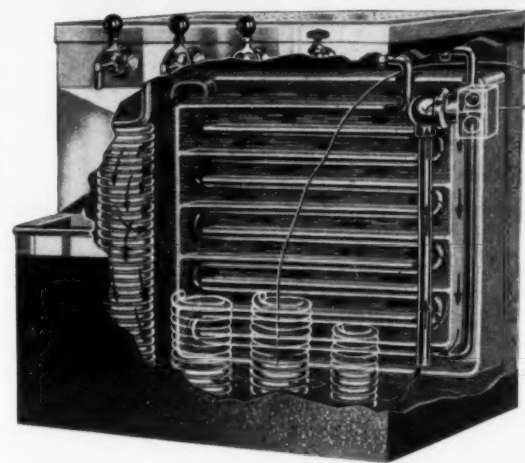
Hops Storage

Hops storage presents another refrigeration problem in a brewing. In answer to a question as to the effect of increased air circulation in connection with oxidation, the speaker answered that to date no evidence has come to his attention that the increased air circulation due to the use of unit coolers has any marked effect on the rate of oxidation. On the other hand, he amended, uniform and controlled distribution assists materially in maintenance of uniform temperature and relative humidity.

The two principal requirements, he laid down were: temperature maintenance at 32°F.-36°F. and humidity at 65%, to maintain the correct moisture content at about 10%. It has been his experience that the surface type of unit is preferred with thermostat control for off and on operation. Automatic defrosting can be obtained with defrosting thermostat, which allows fans to operate during defrosting period.

A separate humidity control is not required, Mr. Jones believes, as a back pressure valve for refrigerant temperature control will automatically maintain operation at the sensible heat ratio corresponding to room humidity at 65%.

Cold Water Circulation Used in Leitner Cooler



This phantom view of the Leitner beer cooler shows how the water is circulated over the cooling coils and then over the beer coils to cool the beverage.

CHICAGO — Uniform temperatures and temperature control within close limits through means of a circulating cold water cooling method are claimed for the new "Leitner System" of draft beer cooling made by M. Leitner & Co.

The Leitner system is built within a watertight, aluminum case. The refrigeration coils are baffled inside the case, near the back. On the outside of the case is an intake tube which extends downward to within 1 inch of the bottom of the case. At the top of the intake tube, and within it, is a small patented propeller that is constructed in such a manner as to draw in the water of the coil box.

The revolving blades of the propeller draw up the water and force it into the case and through the system by centrifugal force. Rotation is at the rate of 1500 r.p.m., the propeller being connected to a 1/20-hp. motor which is installed outside of the beer cooler.

This cooling unit is installed back rear walls of the tap and coil box.

For an efficient installation, it is recommended that the beer coils be wrapped around a cylinder 3 to 4 inches in diameter, and set against the front cooler wall. Both the coils and the new unit should be submerged in a sweet water bath coming within four inches of the top of the coil box.

The Leitner system cools the water bath and circulates it around the beer coils. Circulation of the cold water, however, occurs only when there is a 1° F. rise in the temperature of the water bath.

Cold control switch for the Leitner system is connected to a tube which is immersed in the beer coils. At a slight change in temperature the gas in this tube expands or contracts, making or breaking the electrical circuit which starts and stops the water circulating motor.

On a "single-type" installation the motor for the propeller and the compressor motor are connected in series with the cold control switch.

A DIME HELD CLOSE TO YOUR EYE LOOKS BIGGER THAN A DOLLAR THREE FEET AWAY—IT'S MERELY AN ILLUSION

Control valves represent only a fractional part of the total cost of a refrigerating system — yet control valves are the most vital part of the system — the brains if you please. One free service trip may frequently cost more than the price of the control.

Low Price is not a Synonym for Economy

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Alco Series "T" Thermo Valves for Sulphur Dioxide, Methyl Chloride and Freon are startling innovations. No other valves compare in simplicity of design, rugged construction, ease of installation, freedom from trouble, accuracy of control or choice of sizes to accommodate all capacities required in modern refrigerating systems.

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Thermo Valves — Expansion Valves — High Pressure Float Valves — Low Pressure Float Switches — For All Usual Refrigerants — For Air Conditioning or Product Cooling

Around the World

With George F. Taubeneck

IN addition to learning about refrigeration activities in foreign countries, Mr. Taubeneck has been getting a practical education in the theory of money, the gold standard, foreign exchange rates, and the real significance of the devalued American dollar. During the past few weeks particularly, when he has been moving rapidly from one European country to another where he has had to deal with people whose language he could not understand, he has been getting his education the hard way.

For example, after being fined at the Austrian border for some inadequacy of his passport, he cashed an expense check for 500 shillings mailed to him in Vienna only to find that travelers are permitted to take only 200 shillings out of the country. Having a few shillings over the quota, he frugally spent the surplus for a couple of shirts. At the border between Switzerland and Germany he was again fined 12 marks for having the wrong kind of a visa. After holding up the train for a half hour he succeeded in trading 4½ Swiss francs to a passenger for 4 German marks and selling his two new shirts to another passenger for 8 marks and thereby satisfied the law.

Singapore—Grand Central Station of the World

ED WILCOX, Kelvinator export manager, told us to be sure and stay at the Raffles Hotel in Singapore.

"It may be expensive," he said, "But it's an experience you shouldn't miss. It's the most famous hotel in the world, and the best place I know of for watching the intermingling of various racial types and nationalities."

Everything Ed said was true, including the expensive part. At that it wasn't such a banknote gobbler as the Hotel des Indes in Batavia (now there, gentlemen, is one swell place to stay—spacious quarters, luxurious surroundings, elegance of manner, and the quickest, best service in the world, surely).

But what a pleasure it was to drop into a chair by a table on the wide, open-air lounge of the Raffles shortly after 4 o'clock in the afternoon (when all business houses close in Singapore) and watch the world go by. This lounge fronts on the Singapore harbor, which in itself is so fascinating that one could watch it, probably, for weeks on end—the busiest, fullest-of-ships harbor I have ever seen.

Prospective registrants at the Raffles enter from the front of this mammoth lounge and walk down one side of it to the registration desk, so that a table-sitter gets ample time to look them over—going and coming.

It reminded us quite a lot of a big railway station waiting room, that lounge. You know how fascinating it always is to watch the various people in a place like Grand Central Station in New York. Well, imagine a place five times as comfortable—with three or four servants on the jump to empty your ash tray or bring you what you want at the moment you want it—while travelers from every corner of the globe come in, go out, or stop awhile.

If your imagination is good, you will fashion a dozen short stories per hour in your mind at the Raffles, just guessing who these people are, and what brought them here. On their faces you will see intrigue and suspicion, love and greed, ambition and enervation, despair and lust, alertness and inertia. And they run the gamut of dress.

Over there is a tall, handsome girl wearing a monocle. At the next table is a Spanish grandee, talking to three fat Dutchmen. Aloof Englishmen bow low to exotic creatures who are probably Eurasians, those outcast half-caste people without a country, without a race, who are sometimes brilliant, and among whom are some of the world's most beautiful women. A bearded German sea captain converses rapidly and intently with a short, swarthy man who might be an American gangster, but who probably isn't. And so on, all around the lounge.

The hotel is built something like Des Indes. It is only three stories high, but covers an immense acreage. Your "room" will have a semi-open porch, with three tables, several chairs, and a divan. Inside is your bedroom, the size of a private dining room in an American hotel.

Beds have coil springs and a "Dutch wife," which is long, cylindrical pillow that one is supposed to straddle while sleeping. It's said to keep you cooler, an assumption which we can't verify, for we regularly tossed it out. Then there's a dressing room, enough closet space for a Barbara Hutton, and a bathroom with a real shower and tub and soap! (most hotels in the East don't furnish it).

S.S.S.

It's a common joke around this extraordinary city that the address

initials, S. S. S. (Singapore, Straits Settlements) mean Sex-Starved Singapore. And it is a fact that the adjective holds.

Nightly at the Raffles there's dancing in this big semi-open lounge. Almost half the tables will be filled with groups of men, who come down to enjoy the music, drink, and look at the women dancing. They are most persistent starers, and seem not one whit abashed.

Again, one frequently sees a girl escorted by three or four men. All seem to be having a swell time, and apparently it's quite a usual thing.

The great preponderance of men to women, I was told, is one of Singapore's knottiest problems. This situation is responsible for one rather sad, unwelcome race of Eurasians. It's also responsible for widespread disease in a city which otherwise would have some of the finest health stations in the world. Somehow, this is one phase of colonization which the English frequently seem to ignore, or neglect. This condition did not obtain in Java, where the Dutchmen invariably had buxom Dutch mates, and no man seemed alone.

One of the best things England could do for Singapore, it seems, to me, would be to send out a shipload

of English girls, just as they did for our Puritan forefathers in America.

Make It, Beat It

The attitude of the Englishmen who come to Singapore seems to be: "I'll work here, make as much as I can, spend little, and beat it back home with my spoils."

There is very little social life, the place is highly inhospitable to newcomers, there isn't much recreation to be had, and the lot of single men who come to Singapore "on contract" seems to be a dull one.

Most of these young men appear to look upon their jobs as a sort of sentence, to be served out with fortitude for the sake of the money and the experience.

Older men who settle here take long leaves of absence, possibly several months out of the year. Furthermore, they have made no attempt to establish educational facilities for their children, but ship them all back home at tender ages, where they remain until fully schooled.

Civic Pride

To a casual observer of the people,

it would seem that there is no civic pride in Singapore. Yet, if you examine the public works, it's obvious that there must be a great deal.

Singapore is like Chicago in having a magnificent waterfront for a front yard, and in having reclaimed that front yard from the water.

After almost any public building or domain is pointed out to the visitor, he is told that it stands on what once was swamp or water. These fine man-made plains have been made by cutting down hills and dumping the dirt into swamps and on the seacoast edge.

The clean, modern wharfage, the whopping big soccer fields and playgrounds at the edge of the business district, the magnificent airport which is so close to the center of the "downtown" part, sites of many public buildings, all these are on reclaimed ground.

Praise is also due for the excellent water system which brings pure water from the mountains of Johore to the tables of Singapore. This water system is said to be the only one of Singapore's public works which has been constructed on bonded indebtedness. The rest were all built out of accumulated revenues.

(Continued on Page 21, Column 1)

THEY ALL AGREE

on one point

Women said: "This is the finish we've wanted. And this is the refrigerator we'll buy."



Dealers demanded: "Give us DULUX-finished boxes because the advantages of this DULUX finish make strong selling points for any refrigerator."



Manufacturers decided: "We'll use DULUX on our household refrigerators because it has everything women want and the things dealers can sell."



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Confirmation of their judgment lies in the fact that today more than 2,000,000 household refrigerators have been finished, sold and bought with a DULUX finish on them.

DULUX, as one of the outstanding developments of all time in organic finishes, has the best qualities of previously known finishes, plus others that belong to it alone.

There's BEAUTY. A startling white.

There's LASTING BEAUTY. The white stays white. It keeps its brilliance and gloss. Dirt does not cling. Finger marks do not disfigure it.

There's REMARKABLE DURABILITY. Against household oils, greases, and acids. Against scratching and marring. Against damage from moisture. All of which means that maintenance and refinishing costs have vanished.

BEAUTY—DURABILITY—ECONOMY...sell them all through DULUX and speed the sale of refrigerators.

Let DULUX add its outstanding advantages to the other sales points of your refrigerators.

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DULUX

REG. U. S. PAT. OFF.

for refrigerators

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JULY 1, 1936

Free Competition as a Protection to the Public

PUBLISHED on this page are two letters requesting advice on a source of information for the guidance of the housewife in selecting an electric refrigerator.

One letter is from a housewife whose principal concern seems to be that of the cost of operation. The other letter is from the head of the Department of Electrical Engineering of a great state university whose assistance has been sought by one of the "women members of the University staff who has much to do in extension work throughout the State of Illinois and who is frequently asked to give suggestions about the purchase of electric refrigerators."

We have often been puzzled by the problem as to how such questions should be answered since we have no established service (either free or at a price) for the general public, and there is no such service offered by others which we can recommend.

It seems that a great many people feel that someone who knows all about refrigeration should be ready and willing to give reliable information without charge, or at nominal cost. The whole situation is an interesting development of the extensive use of mechanical appliances in the home and, so far, public educational services have not caught up with engineering progress.

Laboratory Tests Are Expensive

In our opinion the only advisory service which would be of any great value to the public would have to come from a well equipped laboratory with adequate facilities for making a great variety of tests which would show the comparative merits of the various models of all makes. Competent independent laboratories are available but the demand for their services usually comes from large-volume buyers who can afford to pay the cost of the desired tests, or from those who seek to prove their claims.

We do not believe that the buying public is being greatly handicapped by the lack of such a service. At present the forces of competition in the electric refrigeration business represent a practical and effective protection for the reasonably intelligent buyer.

While the average buyer may not be able to detect the fine points of difference in the construction of

various makes of refrigerators, the engineers connected with these companies do recognize the differences in quality. They are quick to inform their own sales organizations regarding every advantage which their product may have over competitors. They are also constantly alert to every possible weakness in their competitor's products.

Thus it is only necessary for the buyer to lend a willing ear to competitive salesmen, and possibly ask some pointed questions, to pick up all the necessary information needed for practical purposes in making a selection.

Forces at Work to Improve Values

Furthermore, the forces of competition are constantly driving the engineering and production departments of the manufacturers to use all their ingenuity to make a better product at less cost. The large number of companies in the business has defeated any tendency to maintain price levels arbitrarily, or to retard the introduction of new ideas.

In fact, manufacturers, distributors, and dealers alike have long complained bitterly that the intense competition and the frequent introduction of new designs has resulted in giving the public far more than its money's worth.

How Progress in One Industry Helps Others

In addition to the steady progress of engineering development by manufacturers of complete units, the industry has had contributions to its product improvement from the suppliers of parts and materials, many of whom had their origin in other lines of industry. The refrigeration industry has reciprocated, however, because its large-quantity purchases have made possible notable improvements in parts and materials for other types of equipment.

This matter of improving the products of other industries was strikingly brought out in the paper on "The Shell Type Porcelain Enameled Refrigerator" presented before the midyear convention of the American Society of Refrigerating Engineers by two engineers of Frigidaire Corp. They related how development work and tests by their company had led to marked improvements in the art of porcelain enameling, and to improvements in metals used in refrigerator construction.

Testing a New Product in the Field

The manner in which the public is protected when new products are introduced on the market was explained by Messrs. Meacham and Schweller of Frigidaire as follows:

"... After seeing the experimental results up to this time, a decision was made to build 2,000 shell type cabinets on a semi-production basis to verify the earlier findings. Tools were built and production was started on these cabinets. Every shell was numbered and its history recorded. The cabinets were sent to the field to be sold. Accurate records were kept of the cabinets..."

So long as competition has free play, many forces are at work to give the public better value for its money. Only under monopolistic conditions is it necessary for an industry to be regulated. As long as many sellers aggressively seek the favor of the buyer, he has little need of paternal supervision in making his purchases.

The elaborate tabulations of specifications in this issue, and the great interest in this data throughout the industry are an indication of the free and active competition in the sale of electric refrigerators at the present time.

Letters

Housewife Inquires About Cost of Operation

837 Lincoln St.
Jackson, Mich.

June 13, 1936

We are interested in buying an electric refrigerator and would like to know a little more about them as we cannot afford to buy something costing too much to operate. Would you please send me your magazine (collect) that contains this news?

MRS. L. J. KILL

Answer: See editorial on this page.

What Factors Should the Buyer Consider?

University of Illinois

Department of Electrical Engineering
Urbana, Ill.

Dear Sir:

I wish to thank you for the sample copies of your paper which you sent a few weeks ago. The technical data which I found in these sample copies regarding the various details of electric refrigerators which are on the market makes me wonder whether you have made a similar compilation concerning the factors which the housewives should take into consideration in reaching a decision as to the particular refrigerator which they should buy. If you do not have such a compilation can you refer me to some place where such material has been printed.

I am writing to you about this material at the request of one of the women members of the University staff who has much to do in extension work throughout the state of Illinois and who is frequently asked to give suggestions about the purchase of an electric refrigerator. What we have in mind is something similar to what the automobile people have put out concerning the factors which a prospective customer considers in the purchase of an automobile.

ELLERY B. PAINE,
Head of Department.

Answer: See editorial on this page.

Compliments Survey of Ft. Wayne Activities

E. A. Barnes Electrical
Appliances, Inc.
Wayne & Harrison Sts.
Fort Wayne, Ind.

June 20, 1936

Gentlemen:

I want to compliment you and your staff on the write-up of the refrigerator sales problems in Fort Wayne. This is very enlightening and constructive reading for us because it reflects very truthfully what is apparently on the minds of the electrical specialty dealers in Fort Wayne.

It lays bare some of the subversive matters; shows where some are thinking ahead; others living just in the present, and some in the procession of unburied dead. The open letters on courageous editorials and etc. is still going strong and your stand in the matter has certainly been justified and proven. MORE AND BETTER INK IN YOUR PEN!

Please send us two copies of your June 17, 1936 paper and we would be greatly obliged as we wish to keep these facts before us where we can refer to them at any time.

E. A. BARNES, President.

Tabloid Headlines

Ignition Service & Supply Co., Inc.
Distributors
Stewart-Warner Refrigerators
16 Central Ave.
Albany, New York

June 23, 1936

Publisher,

I enclose herewith copy of the New York Daily News, Saturday, June 6th and ask you carefully inspect the photographs on page 19, then turn to page 3 and read the news article in reference to these pictures. You will note the article states that sulphur dioxide gas fells seventeen girls in Five and Ten Cent Store.

I think you are doing the Grunow refrigerator a great injustice by your editorial "The Fear Appeal in Advertising." Such is certainly not the case in Grunow advertising. All Grunow is trying to do is to advise the public certain refrigerators have a nasty odor and very harmful effects would result in the case of a refrigerator leak. Further, that condition cannot exist with the Grunow Carrene Refrigerator box. In other words, if Carrene had been used in the F. & W. Five and Ten Cent Store, seventeen girls would not have been overcome by sulphur dioxide fumes as stated by the paper.

There is no fear instilled in the minds of the refrigerator buying public in Grunow advertising. Grunow simply advise them to play safe and buy Grunow refrigerators. Naturally,

those refrigerators not using a safe refrigerant are very much against Grunow capitalizing on his ace in the hole.

W. J. ZEHNER

Answer: We have carefully inspected photographs and read the news article as requested but do not see what that stuff has to do with the merits of Grunow's advertising.

We'll hand it to the Daily News camera man for getting some good shots of the 5 & 10 store girls' knees, also to the imaginative rewrite man for his ingenuity in putting sex appeal into the story. Also a couple of rahs for the headlines who wrote "Ann Harding Totes Gat to Shield Jane" (on the same page).

We'll agree that sulphur dioxide smells bad. So does the subway. So does the Daily News.

An Order from Manila Via the China Clipper

California Refrigerator Co.
1077 Mission St.
San Francisco, Calif.

June 16, 1936

Please find inclosed one year's subscription for the NEWS and an order for one MASTER SERVICE MANUAL. This is for Mr. Day in Manila and perhaps you would be interested to know that it arrived by the China Clipper today and the order left Manila less than 100 hours ago. We are therefore, sending this to you by air mail to Detroit. The Air Clipper to Manila plus our good friend George Taubeneck's fast trip around the world has proven that everybody in the world lives almost next door.

We also inclose an order for 20 MASTER SERVICE MANUALS.

We also inclose an order for a large quantity of Household Refrigerator Specification edition of the NEWS (second edition dated July 1, 1936).

You will be interested again to have us tell you that we are selling a great many single copies of the well edited NEWS, as well as securing many subscriptions of the same, and this one sent from Manila less than 100 hours ago shows that your weekly publication is being read around the world. Our 137 page catalog made the sale.

CLARENCE F. (SANDY) PRATT,
President.

Five Long Years!

Honolulu Technical School
P. O. Box 2941
800 S. Beretania St., Honolulu, Hawaii

June 10, 1936.

Editor:

We attach herewith in the sum of \$3.00, covering a subscription to your magazine for one year.

Best regards for the coming year and we hope that the efforts of the dealers and distributors to eliminate long drawn guarantees, is eventually successful, and we will return to a guarantee of approximately 90 days to 12 months, with a guarantee limited to parts, replacement or some such arrangement.

We feel that this will benefit the industry ultimately and will break down the spectre of long drawn out service now facing dealers.

In any other business, at the end of the month, or so, the dealer, or distributor, knows approximately what his net profit has been on each individual item. In refrigeration it is 5 years or so before the average dealer knows that he is clear of the woods.

S. E. GILES, Manager.

Savings Effected by Replacing Obsolete Units

York Ice Machinery Corp.
York, Pa.

June 26, 1936.

Editor:

The article in your May 27 issue which reported savings as high as 40% through replacement of non-automatic ammonia machines with Freon machines in New York restaurants was based on a study of obsolete ammonia units replaced by modern Freon units.

There was no intention to compare modern ammonia equipment with Freon equipment, but simply to show that large savings can be secured by replacing old, obsolete restaurant refrigeration systems (of which there are a great many in operation) with modern Freon units.

We will appreciate the publication of this letter to clarify this point.

C. A. PEARSON, Nat'l Supervisor.

What Percentage of Sales Are Replacements?

Hearst Magazines Inc.
57th Street at 8th Ave.
New York, N. Y.

Editor:

McGraw-Hill, here in New York, have advised us to write you relative to year by year figures on obsolete and replacement units for the domestic electric refrigerator industry.

We have endeavored to compile these figures and McGraw-Hill informs us that they have tried to do so, but our results show wide variations with your reported figures of refrigerators

in use year by year since 1925. If it is at all possible for you to give us these figures, or could indicate a method whereby such figures might be estimated, we would be very grateful for your help.

I am wondering if it would be possible to procure this information on the basis of saturation percentages year by year. Do you believe such a method might be worked out? It occurs to me that a very important piece of research might be developed from this idea that would be helpful not only to the industry, but to all organizations having to do with marketing.

This information is so frequently requested, and our information is of such elementary detail, that until we have more complete figures we shall not be able to do the work ourselves.

Thank you for anything you may be able to do for us.

JEAN WOLVERTON,
Marketing Division.

Answer: Discussions of this subject were published in the issues of Jan. 22, 1936 (page 10), and Jan. 16, 1935 (page 17). Unfortunately, no authentic records are available (so far as we know) which might be used for comprehensive analysis of the replacement market.

Advertising Results

Betz Corp.
Filterpure

Betz Building, Hammond, Ind.
June 22, 1936.

Business Manager:

I want to tell you how pleased we are with the results of the advertising matter we are running in your Buyer's Guide Column.

Your issue of June 17 was the second time that our advertisement appeared up to date. With only the two insertions we have received inquiries from all over the country and what is more important they have resulted in a large number of substantial orders.

We have used other forms of advertising in connection with Filterpure but our cost per order received has been approximately 500% more than the amount of money we are spending with you in the Buyer's Guide Column.

LYMAN B. BETZ.

Pacific Coast Buyer

Conditionair Corp.
153 Seventh St., San Francisco, Calif.
Gentlemen:

Expect to be east within the next 30 days and would like to know if it would be possible to get the names of manufacturers of counter freezers, un-assembled fin coils, ice cream cabinets, and water coolers. Any information that you can give us will be greatly appreciated.

L. A. ORTIZ.

Frigidaire Service Manager

George T. Stevens Co.
Frigidaire, Electrol Oil Burners, Electrol Boilers, ABC Washers, Graybar Crawford Electric Ranges
75 Irving St., Framingham, Mass.

June 27, 1936

Gentlemen:

We are a Frigidaire dealer but also service all makes of electric refrigerators and oil burners. We have been subscribers for ELECTRIC REFRIGERATION NEWS for a number of years and would appreciate it if you would put our service managers name on your catalogue mailing list. His name is C. B. Spicer, 963 Worcester Road, Framingham Center, Mass.

We thank you in advance for this courtesy.

S. F. GEELEY

Cheap Enough

Co-operative Mail Service
126 Lexington Ave.
New York, N. Y.

If interested in a New York representation at an insignificant cost compared to its value as a business asset, then, we wish to draw your attention to our organization which has been created by successful business men for that very purpose.

It is not necessary to go into details of the biggest and greatest commercial center in the world today, but it suffices to say that New York furnishes the business blood stream that supplies the arteries that branch out all over these United States and the rest of the world.

You will have at your disposal, to use as you see fit, our whole office situated in the heart of the city, with a business-trained personnel, at a cost of only \$2.50 per month.

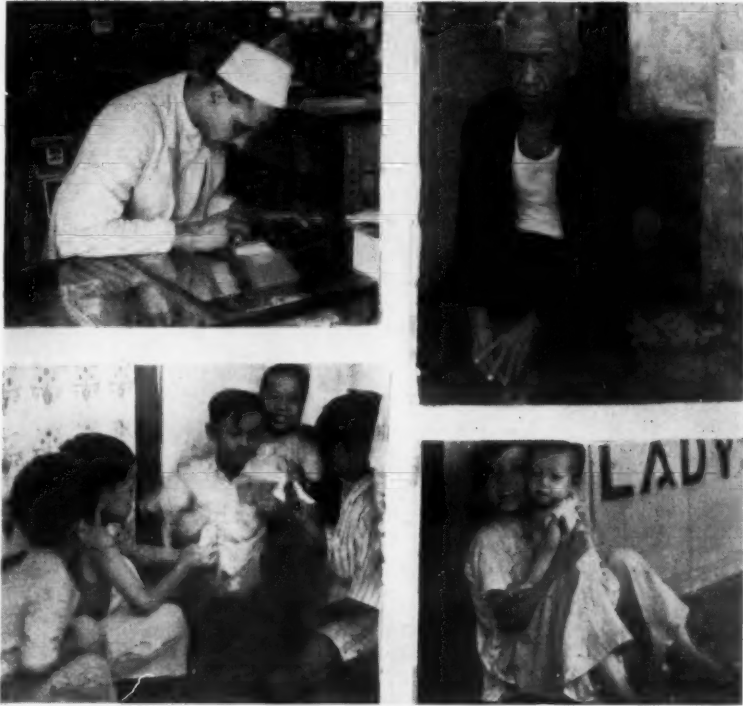
We will exhibit your copies, receive your customers, answer your ad and phone calls. We will also receive, answer, and forward your mail.

To be brief, for \$2.50 per month, we will do just what you would expect your employees to do if you were to operate an office under your personal supervision, at an expense of between \$100.00 to \$150.00 per month.

JAMES CORUBIA,
Managing Director.

Answer: We are not interested in your proposition but we love that stuff about New York and the "business blood stream that supplies the arteries, etc."

Street Scenes in the Native Quarters



Interesting scenes in Singapore's native quarter. Above, left: A Hindu money changer—the city has many of them. Right: This excellent snapshot by George Taubeneck shows one of Singapore's older Chinese residents. Below, left: Young men of the district get together in a friendly little game. The youngster in the center looks like he'll stand pat. Right: Singapore girls—ages about 6 and 1.

(Continued from Page 19, Column 5)

Truly Cosmopolitan

Our Own New York can truly claim to be a cosmopolitan city, for more than a dozen different nationalities have their cities-within-a-city in Greater New York; however, outside of the negroes of Harlem, the colored races are not well represented in our chief metropolis.

But in Singapore one senses immediately that here is a cosmopolis. There's the stream of travelers and marine merchantmen from all corners of the earth, pouring in and out continuously. There are too, the English trades, and the Dutch trades, and the Germans, and, of course, the Chinese. Added to these are the hordes of laborers—Chinese, Indian, Malay.

The Chinese have been here for centuries, and have made the place their very own. Indians are absorbed in it, wandering up and down the highly Chinese streets with a lost look upon their countenances, and a childlike manner. Malays accept the Chinese domination with stoical obliviousness.

People back home are sometimes inclined to think that Singapore is in China. Should they come here without consulting a geography or talking to anyone who was informed, they might go home still blissfully unaware of their mistake; for when you get beyond the business district which centers around Raffles place, you find yourself at once in Chinatown.

The crowded, open air bazaars and restaurants, the padding Chinese women and children in their national habiliments, their high-pitched Oriental cries, the smells and sights and sounds, are all very Chinese.

My good friend Mr. Lee assured me that the great part of Singapore is typically and authentically Chinese, although it is perhaps a bit cleaner and not so poverty-stricken as the home country.

These Chinese are of many races and creeds and languages. Some of them, whose families have been here for generations, speak Malay or English, rather than Chinese.

A number of different racial types were pointed out to us; but the only one we could identify now would be the Hailams, who are predominantly house servants—and maddeningly lazy, independent, inefficient servants they are, too.

One thing which endeared the Chinese to me is their love for eating after midnight. There is at least one street in Singapore which is thronged with open air food stalls. Stationed in the center of the wide asphalt paving, like the parkway of a boulevard, these stalls are protected by tent tops, and formed by piling planks on sawhorses or kegs, square fashion, with the cooks and charcoal stoves within.

Around these planks sit the customers, on high stools. One of their favorite dishes is satay, which consists of roasted or broiled chicken, goat's meat, beef, and duck, cut into chunks and strung on sticks.

You pick up a stickful of these morsels, and dip them into curry and sauces, then eat.

For the benefit of those in the audience who have never heard of curry, let us explain that it is a rather dubious mixture of peppers and spices, ground into a fine powder, and used everywhere in the east—from northern Australia through the Dutch East Indies to India and per-

haps much farther—to season rice.

Be warned; strong horseradish is as mild as vanilla sauce in comparison. There are generally three grades: hot, scorching, and explosive.

Chinese temples are something to see, also. It's never very clear just what the religion of the individual Chinaman is. In general, Buddha, Confucius, and Lao-Tze may be said to be the three great spiritual leaders. There's also ancestor worship, and animism, scores of miscellaneous dieties and goodness knows what else. This babel of spiritual tongues is echoed in the heterogeneity of their temples.

Apparently the religion of most Chinamen, at least in Singapore, consists of a little bit of all these, plus a dash of joss stick and incense burning before idols, together with a great deal of feasting.

By accident the writer got in on one of those feasts, in a small way. Here's how it happened:

The houseboy assigned to me at the Raffles had failed to clean and press my white dinner jacket one evening, nor could he be located. Having no substitute, I had to wash it out myself in the lavatory.

After drying it in front of a powerful floodlight trained on the Raffles, I went to the rear of the hotel in search of someone to press it.

There they were, perhaps 50 feasting Chinese, all workmen at the Raffles, with their women. In two rooms they were gathered around big tables, eating the apparently innumerable courses served to them, and laughing and shouting. I was told that it was a feast day, and that no pressing could be done.

Hurrying back to the lobby of the Raffles, I procured four tins of Chesterfields (all cigarettes in the East are packed in hermetically sealed round tins of 50—in Singapore one of these tins of Chesterfields sells for less than an American quarter). Returning with these, I opened them and passed them around.

The Chinese were delighted, and invited me to join them, which I did. None of the food was recognizable, but it was most delicious, and rarely and richly seasoned. Three men cooks were concocting it over charcoal fires outdoors.

I beamed my approval, and was quite adopted. After a time one of the boys quietly arose, picked up my limp dinner jacket, and pressed it without a word.

Malays:

While the Chinese dominate and seem to absorb the other races (although not literally, for there is little racial intermarriage between Hindus, Malays, and Chinese), the other races are certainly present and in evidence.

The native Malays, who had the place first, are something akin to the Javanese in appearance, customs, and habits. They are chiefly Mohammedans, with some Brahmans amongst their number. That makes them ecclesiastical brothers of the Hindus, with whom they work side-by-side.

One thing which the Malays have done to stamp the impress of their nationality and race upon Singapore is make their language a sort of Esperanto, or common tongue, which almost everybody speaks to some extent, including the Chinese and Hindus.

Most Malays seem to be peddlers, running or dogtrotting down the street with loads strung from either end of shoulder yokes, or pull rickshaws.

As in Hawaii, it's considered quite the thing to sprinkle Malay words and phrases through your conversation even when talking to other "whites." Here's a useful working glossary picked up from various friends during our stay there:

Afternoon—sore (sorray).
A little—sedikit (S'dee-kiit).
All right—soeda (soedah).
At what time is dinner—Poekel brapa makam (Pookool brapa makam).
Barber—Toekang tjoeker (Tookang Chookoor).
Bath (to)—Mandi (mandy).
Bed—Tempat tidoe (empat tee-doe).
Be off (go)—pigi (piggy).
Boat—sampan, tambangan (tambangan).
Book—boekoe (boo-koo).
Boy—Djongos (Jongos) spada (spah-dah).
Bread—Rotti (Rotty).
Breakfast—Makan pagi (makkan paggy).
Bring (to)—Bawa (Bahwah).
Call (to)—Pangil (Pang-gil).
Carriage—Kareta (K'retta).
Cigar—Roko (Roh-koh) cheroetoe (cheroetoe).
Cigarette—Sigaret (cigaret).
Clean—Bersih (Bersy).
Clean (to)—bikin bersih (bee-kin bersy).
Cold—Dingin (Dinggin).
Collar—Kraag (Craach).
Comb—sisir (see-seer).
Cushion—Bantal (bantal).
Day after to-morrow—Hari loesa (Hahry loosah).
Day before yesterday—Hari kemaren doeloe (Hahry kemahren doo-loo).
Dining room—Kamar makan (Kamar mak-kan).
Dinner—makan malem (mak-kan mah-lem).

Dog—andjing (anjing).
Don't forget—Djangan loepa (Jangan loopah).
Don't want it—Tida maoe (Tee-dah mow).
Drawer—latjie (lah-chee).
Driver—Koesir (Cooseer).
Dry—kring (kring).
Eggs—telor (T'lor).
Eggs hard boiled—telor mateng (T'lor mah-teng).
Eggs soft boiled—telor stengah mateng (T'lor stengah mah-teng).
Eggs fried—telor mata sapi (T'lor mah-tah sapp-y).
Electric tram (street car)—tram lestric (tram lestric).
Eleven—sabelas (S'blasse).
Enough—sampe (Sampey).
Every day—saben hari (sah-ben hah-ry).
Everything—semoea (semooah).
Eye—mata (matta).
Eye glasses—katja mata (katcha matta).
Fire—api (Ah-py).
First class—klas satoe (class sah-too).
Fish—ikan (Ee-kan).
Flower—kembang (Kem-bang).
Fork—garfoe (Garr-foo).
Four—empat (Amm-patt).
Friday—Hari Djoemahat (Hehry joo-mah).
Fruit—boewa-boewa (boo-ah-booah).
Five—lima (lee-mah).
Garden—kebon (kebon).
Girl—nonna (nonna).
Go back—balik (bahlick).
Go home—poelang (poo-lang).
Go ahead—madjoe (mah-joo).
Gold—mas (mass).
Good day—tabe (tah-bay).
Green—idjoe (ee-joo).
Half—stengah (stengah).
Half past two—stengah tiga (stengah tee-gah).
Ham and eggs—mata sapi sama ham (matta sah-py sah-mah ham).
Hand—tangan (tang-gan).
Handkerchief—setangan (s'tang-gan).
Hat—topi (toa-py).

Head—kapala (kah-pah-la).
Hill—boekit (book-it).
Hot—panas (pah-nas).
Hotel—roemah makan (roo-mah makkan).
House—roema (roo-mah).
How much—berapa (b'rappa).
Hundred—seratoes (S'rah-toos).
I come—Saja dateng (Sah-yah dah-tang).
I give—Saja kasi (Sah-yah kassy).
I leave—Saja pigi (Sah-yah piggy).
I pay—Saja bayar (Sah-yah bah-yar).
I want—Saja minuta (Sah-yah minutah).
I won't—Tida maoe (tee-dah mow).
Ice—Ajer batoe, ys (Ah-yer bah-too, ice).
Ice water—Ajer ys (Ah-yer ice).
In two days—didalem doewa hari (dee dah-lam doo-a hah).
In, inside—didalem (dee-dah-lem).
Key—Koentij (coonchy).
Knife—peso (pe-so).
Knock—poekol (pookool).
Know (to)—taoe (taouw).
Lake—telaga (t'lah-gah).
Large—besar (b'shar).
Last night—kemaren sore (k'mah-ren saray).
Last week—mingoe doeloe (ming-goo doo-loo).
Last month—boelan doeloe (boo-lan doo-loo).
Laundry man—penatoe (penatoo).
Leave (to)—pigi (piggy).
Letter—soerat (soo-rat).
Little bit—sedikit (s'dee-kiit).
Long—Pandang (pan-jang).
Look—lihat (lee-hat).
Luggage—barang (bah-rang) bagasie (bahgahsy).
Match—korek api (koa-rek ah-py).
Meat—daging (dah-ghing).
Menu—soerat makan (soo-rat mak-kan).
Milk—soesoe (soo-soo).
Minute—Minuut (min-oot).
Monday—Hari senen (Hah-ry say-nen).
Money—wang (wanng).
More—lagi (lah-gy).
(Continued on Page 23, Column 1)

**SHE ISN'T AN ENGINEER
BUT SHE KNOWS
HIGH QUALITY**



LET G-E MOTORS HELP YOU SELL APPLIANCES

SHE may not know how a refrigerator works, but she does know that she wants a refrigerator that is dependable, that has long life, and that requires little or no maintenance.

Today, when Mrs. America buys a refrigerator, she looks for indications of high quality to assure her that she will get her money's worth. The G-E monogram on the motor not only convinces her that the motor is dependable and care-free, but it also gives her additional confidence that the entire unit is of high quality, for she knows General Electric's high standards of quality. That's why G-E motors **WILL HELP YOU SELL**—why they will give your refrigerators a stronger sales appeal.

General Electric, Dept. 6A-201, Schenectady, New York.

84 PER CENT SAID, "GENERAL ELECTRIC"

In a recent survey, electric-appliance dealers and department stores were asked:

"What makes—or brands—of electric motors, in your opinion, would make it easier for you to sell appliances?"

General Electric was named by 84 per cent.

GENERAL  ELECTRIC

POTTER

Potter Refrigerator Corp., Buffalo, N. Y.

Trade name	Childare	Potter					
Model No.	C-46	C-66	L-66	L-86	D-106	D-136	D-156
Compressor Model No.	ABU	ABU	AD	AD	AD	AD	AD
PRICE							
Retail price, installed.....	\$109.00	\$139.00	\$179.00	\$239.00	\$259.00	\$319.00	\$389.00
Cabinet finish, exterior.....	Dulux						
CABINET DIMENSIONS							
Overall height (inches).....	53 1/4	58 1/2	58 1/2	67	57 1/2	63 1/4	65 1/2
Overall width (inches).....	23 1/2	30 1/2	30 1/2	30 1/2	29 1/2	29 1/2	33 1/2
Overall depth (inches).....	24 1/2	25 1/2	25 1/2	25 1/2	25 1/2	25 1/2	25 1/2
Inside height (inches).....	26 1/2	29 1/2	29 1/2	37 1/2	16 1/2	22 1/4	22 1/4
Inside width (inches).....	18 1/2	23 1/2	23 1/2	23 1/2	24	20	28
Inside depth (inches).....	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	15 1/2	16 1/2
Number of doors.....	1	1	1	1	1	1	2
STORAGE CAPACITY							
Net food storage (cu. ft.).....	4	5	5	8	5	6	6
Number of shelves.....	8.26	13	13	15.4	10.3	13	15
Total shelf area (sq. ft.).....	8.26	13	13	15.4	10.3	13	15
Cabinet finish (interior).....	Porcelain						
INSULATION							
Top (thickness in inches).....	2 1/2	3 1/4	3 1/4	3 1/4	3	2	3
Sides.....	2 1/2	3 1/4	3 1/4	3 1/4	2 1/2	4 1/4	2 1/2
Back.....	2 1/2	3 1/4	3 1/4	3 1/4	2 1/2	4 1/4	2 1/2
Door.....	2 1/2	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
Bottom.....	2 1/2	3 1/4	3 1/4	3 1/4	2	5	2
ICE CUBES							
Number of shallow trays.....	3	3	3	5	3	3	4
Number of deep trays.....	0						
Total number of cubes.....	54	84	84	140	84	84	112
Total wt. of cubes (lbs.).....	3.3	6	6	10	6	6	8
COMPRESSOR							
Ice melting effect 24 hrs.....	96	96	175	175	175	175	175
Motor horsepower.....	1/6	1/6	1/5	1/5	1/5	1/5	1/5
Refrigerant in system (lbs.).....	1	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Quantity of lubricant (pts.).....	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Belt circumference (inches).....	33 1/4						
Belt width (64ths of an inch).....	34						
WEIGHT							
Net weight (lbs.).....							
Shipping weight (lbs.).....	303	400	410	430	470	485	560

SPARTON

Sparks-Withington Co., Jackson, Michigan

Model No.	S-466	D-466	S-616	D-616	S-746	D-746	D-906
Compressor Model No.	D-939						
PRICE							
Price, F.O.B. Jackson.....	\$119.50	\$139.50	\$149.50	\$184.00	\$177.50	\$203.50	\$244.00
Cabinet finish, exterior.....	Sparlac						
CABINET DIMENSIONS							
Overall height (inches).....	56 1/2	56 1/2	54 1/2	54 1/2	54 1/2	54 1/2	57 1/2
Overall width (inches).....	24 1/2	24 1/2	27 1/2	27 1/2	29 1/2	29 1/2	35 1/2
Overall depth (inches).....	22	22	24 1/2	24 1/2	26 1/2	26 1/2	28 3/4
Inside height (inches).....	29 1/2	29 1/2	27 1/2	27 1/2	27 1/2	27 1/2	29 3/4
Inside width (inches).....	18 1/2	18 1/2	21 1/2	21 1/2	23 1/2	23 1/2	27 1/2
Inside depth (inches).....	14 1/2	14 1/2	17 1/2	17 1/2	19 1/2	19 1/2	19
Number of doors.....	1	1	1	1	1	1	2
STORAGE CAPACITY							
Food storage (cu. ft.).....	4.6	4.6	6.1	6.1	7.4	7.4	9.0
Number of shelves.....	4	4	4	4	4	4	4
Total shelf area (sq. ft.).....	8.7	8.7	12.0	12.0	14.5	14.5	17.1
Cabinet finish (interior).....	Porcelain						
INSULATION							
Top (thickness in inches).....	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Sides.....	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3 1/2
Back.....	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3 1/2
Door.....	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3 1/2
Bottom.....	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3 1/2
ICE CUBES							
Number of shallow trays.....	3	3	5	5	5	5	6
Number of deep trays.....	0	0	0	0	0	0	0
Total number of cubes.....	42	42	70	70	70	70	84
Total weight of cubes (lbs.).....	4.1	4.1	6.7	6.7	6.7	6.7	9.3
COMPRESSOR							
Ice melting effect 24 hrs. (lbs.).....	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Motor horsepower.....	20	20	20	20	20	20	20
Refrigerant in system (oz.).....	14	14	14	14	14	14	14
Quantity of lubricant (oz.).....	29.2						
Belt circumference (inches).....	32						
Belt width (64ths of an inch).....							
WEIGHT							
Net weight (lbs.).....	256	265	290	300	310	326	421
Shipping weight (lbs.).....							

COMPRESSOR

Made by Sparton, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. D-939—single cylinder, 540 r.p.m., 1 7/16-in bore, 1 7/16-in stroke.

Refrigerant, sulphur dioxide. Lubricant, Suniso No. 2. Shaft seal, low-side bellows type.

CABINET

Made by Sparton. Steel frame with Spartan-Balsam Wool insulation.

Durez breaker strip, rubber balloon type gasket.

HARDWARE

Made by Winters & Crampton with chrome finish.

MOTOR

Capacitor-start type made by Delco. Oil semi-annually.

CONDENSER

Sparton turbo-type fan cooled, copper tubing with soldered radiating fins.

EVAPORATOR

Made by Sparton, dehydrated drawn brass, direct type evaporator of arbor-wound copper tubing.

Mayson expansion valve refrigerant control. Aluminum ice trays. Tray release.

CONTROL

Tagliabue adjustable temperature control.

Model C2411, mounted inside the cabinet. Standard models, wide-cycle defrosting; deluxe models, automatic defrosting with vacation cycle on both. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year plus 4-year optional replacement contract.

Serviced by: Original dealer and territorial distributor.

Replacement parts are sold to independent service companies if they are authorized Sparton service stations.

SPECIAL FEATURES

Vegabin, Baskador, Baskadrawer, dehydrator, kontanerette, bottle storage space, sliding shelves, interior light, acid resisting liner, automatic defrost electric clock, fast freezing unit.

COMPRESSOR

Compressor Model No. ABU—single cylinder, 430 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Compressor Model No. AD—twin cylinder, 400 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Made by Universal Cooler, open, reciprocating, belt-driven compressor located below food compartment. Shaft seal, bellows.

Refrigerant, Arctic methyl chloride. Lubricant, Argon oil.

CABINET

Made by Leonard Refrigerator Corp., (C-46, C-66, L-66, L-86). Sitka spruce frame with Hermetex insulation, Bakelite breaker strip, rubber gasket.

Models D-106, D-136, D-156 have cabinets made by Rex Mfg. Co., sitka spruce frame, Balsam Wool insulation, Tylac breaker strip, rubber gasket.

HARDWARE

Made by Grand Rapids Brass of brass with chromium finish.

MOTOR

Capacitor-type made by Wagner. Oil every three months.

CONDENSER

Made by Long Mfg. Co., fan cooled, finned tube.

EVAPORATOR

Made by Potter, of copper-brass-aluminum, continuous coil in sleeve type on Models C-46 and C-66; first evaporator, coil in sleeve, second evaporator, large area fin coil on L-66, L-86, D-106, D-136, and D-156.

American Radiator expansion valve refrigerant control.

Aluminum ice trays. One rubber grid with each model.

CONTROL

Ranco adjustable temperature control mounted inside the cabinet, model KR520, having wide-cycle defrosting with vacation cycle on C-46, C-66, L-66, and L-86.

Models D-106, D-136, and D-156 have Ranco non-adjustable temperature control mounted outside the cabinet, model KR519, no defrosting necessary, vacation cycle provided.

Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year.

Serviced by: Dealer.

Replacement parts are sold to independent service companies.

SPECIAL FEATURES

*G.S. General food storage compartment.

F.S. Frozen storage compartment

UNIVERSAL

Landers, Frary & Clark, New Britain, Conn.

Model No.	1444	1455	1466	1477	1488	1866	1877	1888
Compressor Model No.	150ER							
PRICE								
Retail price, installed.....	\$129.50	\$159.50	\$189.50	\$219.50	\$259.50	\$204.50	\$244.50	\$284.50
Cabinet finish, exterior.....	Dulux					Porcelain		
CABINET DIMENSIONS								
Overall height (inches).....	53 1/2	56 1/2	59 1/2	64 1/2	62 1/2	59 1/2	64 1/2	62 1/2
Overall width (inches).....	25 1/2	26 1/2	30 1/2	30 1/2	34 1/2	30 1/2	30 1/2	34 1/2
Overall depth (inches).....	21	22	22 1/2	22 1/2	23 1/2	22 1/2	22 1/2	23 1/2
Inside height (inches).....	27 1/2	29 1/2	31 1/2	36 1/2	38 1/2	31 1/2	36 1/2	38 1/2
Inside width (inches).....	19 1/2	20 1/2	23 1/2	23 1/2	27 1/2	23 1/2	23 1/2	27 1/2
Inside depth (inches).....	15	16	15 1/2	15 1/2	15 1/2	15 1/2	15 1/2	15 1/2
Number of doors.....	1							
STORAGE CAPACITY								
Net food storage (cu. ft.).....	4.2	5.0	6.1	7.1	8.1	6.1	7.1	8.1
Number of shelves.....	5	5	5	6	6	5	6	6
Total shelf area (sq. ft.).....	9.1	10.8	11.7	14.5	15.9	11.7	14.5	15.9
Cabinet finish (interior).....	Porcelain							
INSULATION								
Top (thickness in inches).....	2	2	3	3	3	3	3	3
Sides.....	2 1/2	2 1/2	3	3	3	3	3	3
Back.....	2	2	3	3	3	3	3	3
Door.....	3	3	3	3	3	3	3	3
Bottom.....	2	2	3	3	3	3	3	3
ICE CUBES								
Number of shallow trays.....	2	3	3	4	4	3	4	4
Number of deep trays.....	0	0	0	0	0	0	0	0
Total number of cubes.....	56	84	84	112	112	84	112	112
Total weight of cubes (lbs.).....	4	6	6	8	8	6	8	8
COMPRESSOR								
Ice melting effect 24 hrs. (lbs.).....	120	120	120	155	155	120	155	155
Motor horsepower.....	1/6	1/6	1/6	1/4	1/4	1/6	1/4	1/4
Refrigerant in system (lbs.).....	4 to 5 lbs.							
Quantity of lubricant (oz.).....	32	32	32	32	32	32	32	32
Belt circumference (inches).....	35	35	35	36	36	35	36	36
Belt width (64ths of an inch).....	34	34	34	34	34	34	34	34
WEIGHT								
Net weight (lbs.).....	270	300	335	360	375	360	385	410
Shipping weight (lbs.).....	320	350	390	420	440	425	450	470

Sights in Singapore—Grand Central Station of the World



Top Row: (1) The canal in Singapore is always crowded with skiffs and smaller craft. The boat at left is propelled and steered by a long pole. (2) Singapore's harbor, at dusk. (3) The harbor by day—always crowded with ships. (4) Looking toward the harbor from a window of the Raffles Hotel. Bottom Row: (1) In a corner of the Chinese quarter's business district. (2) Another scene in the Chinese quarter, with more modern buildings in the background. (3) Rickshaws and automobiles are shuffled in this street scene. (4) This traffic policeman has a "stop" sign on his back.

(Continued from Page 21, Column 5)

Morning—pagi (pag-gy).
Mosquito (njamok (nee-ah-mock)).
Mosquito net—klamboe (klamm-boo).
Mountain—Goenoeng (Goo-noong).
Night—Malem (Mah-lem).
Never mind—Soeda (Soo-dah).
Nine—Sembilan (Sem-bee-lan).
Nineteen—Sembilan blas (Sem-bee-lan blas).
Ninety—Sembilan poeloe (Sem-bee-lan poo-loo).
No more—Tida lagi (Tee-dah lah-gy).
Nothing—Tida apa apa (Tee-dah ah-pa).
Office—Kantoor (Kantor).
Open—Boeka (Book-ah).
Orange—Djerok (Jerook).
One—Satoe (Sah-toe).
Paper—Kertas (Kertas).
Path—Djalan (Jahlan).
Pay (to)—Bayar (Bah-yar).
Pen—Penna (Penna).
Pencil—Potlood (potload).
Pepper—Meritja (Mahritiya).
Photograph—Gambar (Garbar).
Piece—Pottong (pottong).
Pitcher—Karap (Kah-rap).
Plate—Piring (Pee-ring).
Policeman—Oppas (Oppas).
Police station—Kantor Politie (Kantor pollee).
Post Office—Kantor Post (Kantor post).
Postage stamp—Kapala radja (Kah-pahla rajah).
Railway—Kareta api (Kretta ahpy).
Rain—Oedjan (Oojan).
Rice—Nasi (nah-sy).
River—Kali (Kah-ly).
Room—Kamar (Kammahr).
Road—Djalan (Jahlan).
Salt—Garam (Gah-ram).
Saturday—Hari saptoe (Hah-ry sap-too).
Scissors—Goenting (Goenting).
Screen—Sampiran (sampeeran).
Seven—Toedjoe (Too-joo).
Seventeen—Toedjoe blas (Too-joo blas).
Seventy—Toedjoe poeloe (Too-joo poo-loo).
Shave (to)—Tjoekoer (Choo-koor).
Shirt—Kamedja (Kak-hmay-ja).
Shoe—Spatoe (Spah-too).
Shop—Toko (Toko).
Six—Anam (Ah-nam).
Slippers—Slop (Slop).
Small—Ketil (Kechil).
Soap—Saboen (Sah-boon).
Soup—Sop (Sop).
Spectacles—Katja mata (Katcha matta).
Spoon—Sendok (Sendock).
Stamp—Kampal radja (Kahpahla rajah).
Station—Stasion (Stassion).
Steamship—Kapala api (Kahpahlahpy).
Stockings—Kaoes (Kows).
Stop—Brenti (brenty).
Sugar—Goela (Goo-lah).
Sunday—Hari minggoe (Hahry-ming-goo).
Table—Medja (May-jah).
Take care—Djaga (Jahgah).
Tea cup—Mangkok (Mang-kok).
Telegram—Soerat kawat (Soo-rat kahwat).
Telephone Office—Kantor Kawat (Kantor Kahwat).
Ten—Sepeloe (S'poo-loo).
That is enough—Soeda sampe (Soo-dah sampey).
Theatre—Roemah komedie (Roomah komaydy).
Three—Tiga (Tee-gah).
Thursday—Hari Kemis (Hahry Kemis).
Ticket—Kartjes (Cart-ches).
Time Table—Soerat kreta api (Soo-rat kretta ahpy).
Toast—Rotti pangan (Rotty pang-an).
Tomorrow—Besok (Bay-sok).
Tooth brush—Sikat gigi (See-kat ghee-ghee).

Tooth Powder—Obat gigi (Ohbat ghee-ghee).

Towel—Handoek (Hanndoek).

Town—Kotta (Kotta).

Train—Kareta api (kretta ahpy).

Tram—Trem (Tram).

Tree—Pohon (pho-hon).

Trousers—Tjelana (chelahna).

Tuesday—Hari selasa (hahry s'las-sa).

Trunk—Kopper (Kopper).

Twelve—Doewa belas (Dooah bla).

Twenty five cents—Setali (s'tahly).

Two—Doewa (dooah).

Umbrella—Pajong (Pah-yong).

Vegetables—Sajoeran (sah-yooran).

Vinegar—Tjoeka (Choo-kah).

Wait (to)—Toengoe (Toong-goo).

Watch (to)—Djaga (jahgah).

Watch (time piece)—Horlodji (hor-logee).

Water—Ajer (ah-her).

W. C. (Gentleman's room)—Kamar ketchil (Kahmar kechil).

Here, coolie, take my luggage—Sini koeli angkat barang (Seene coolie angkat bahrang).

Two men only—Doewa orang sadja (Dooah ohrang sahja).

Yes, Sir—Saja, toewan (sahyah tuan).

Here is the receipt of my luggage, you take care of it, pay the coolies and bring it to the hotel—Ini soerat bagasie kwe djaga, bayar coolie dan bawa di hotel (Eny soerat bahgahsy, kway jahga, bahyar coolie dan bah-wah dee hotel).

Here is 25 cents to pay for the coolies—Ini setali boewat bayar coolie (Eny s'tahly boo-at bahyar coolie).

Where is your bus (car)—Mana im-nibus (kareta) Mahna omnibus (kretta).

Everything alright—Soedah klaar (Soodah klahr).

Go on, then—Madjoe (Mahjoo).

At what time is dinner, boy—Poe-koel berapa makan djongos (Poo-koel brappa makkan, jongos).

Wake me tomorrow at 6 o'clock—Kasi bangoes.

Can I have some breakfast before I leave?—Bisa dapat makan doeloan? (Beesah dahpat makkan doo-loo-an).

Shall I order a carriage for you to bring you to the station and a luggage car?—Apa saja misti pesen kareta boewat pigi di spoor dan kareta bagasie djoega? (Appa sahya misti pesen kretta boo-at piggy dee spoor dan kretta bahgahsy joo-ga?).

Yes, I want a carriage and a luggage car—Ja, saja minta kareta dan karretta bagasie (Jah, sahya minta dretta dan kretta bahgahsy).

Rickshaws

Be sure to go for a rickshaw ride while in Singapore. It's really a comfortable sort of locomotion. But don't use rickshaws to get somewhere; just go for a ride in them.

Even after you have acquired a smattering of that local *lingua franca* which passes for Malay, don't expect the coolies who pull the rickshaws to understand you. They'll grin and nod when you give them directions as if they understand perfectly, but only Allah knows where you'll finish.

At night that's very fine. You go for a refreshing ride in one of these open two-wheeled buggies, riding noiselessly on rubber tires, drawn at just the right speed, enjoying the cool breeze and the moonlight. Where you're going you don't know; but you can feel sure you'll see many strange and weird things, Oriental and inexplicable, and altogether exciting.

No matter what you offer the coolie who pulls the rickshaw in payment for the ride, it's never enough. He'll make quite a fuss about it, too; and

sometime that's embarrassing, if there are others about when you alight.

So make a practice of giving him fewer dimes than you think is right, and then when he starts to yell and gesticulate and shake his head, give him two more.

The husky, bearded, turbaned Indians who are the doormen at the Raffles regularly give arguing rickshaw coolies rough shoves as soon as you have paid them, to avoid scenes.

Many visitors to Singapore are inclined to pity the coolies who pull these carts. True, they run barefoot at a good gait and work up quite a sweat. But it was our observation that they were the happiest of laborers in and around the city.

Personally, we think it would be good fun to pull a rickshaw, just as it's fun to do any sort of rhythmic physical exercise.

Their pay is relatively good, too. They take a great pride in their carts, and keep them well-oiled and in good condition.

The city licenses them, and the rickshaws are labelled "first class" or

"second class" according to their decorations and condition—something which is always good for a laugh among travelers.

Impromptu Basketball

Malays are sports lovers, and have taken readily to cricket, soccer, and outdoor basketball. They are also good boxers. The Chinese make good tennis players. Europeans mix a little in all these sports, and also go in for golf and badminton.

One late afternoon, while waiting for WING LOONG, famous Singapore tailor, to finish a tropical linen suit for us, we strolled around the block. There on a vacant lot were a group of Malay youths tossing a basketball at a regulation bankboard and basket.

Immediately we were struck by the fact that nearly all of them were using the Indiana style of basketball shooting. (There are three common methods of tossing a basketball at the hoop: an underhanded heave, an overhanded push, and a wrist flick. The Indiana method, practiced in the state which harbors the best basketball in

America, is a graceful combination of all three—one starts out in the underhand position, brings the ball up past the chest as for an overhand shot, and ends with a deft wrist flick).

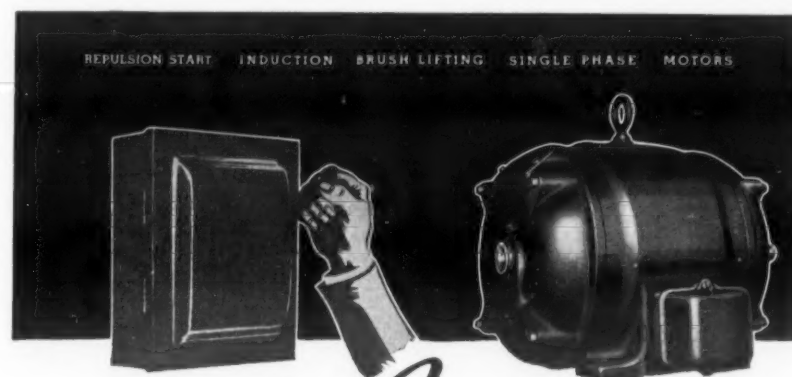
Unconsciously I found myself imitating that motion, something which I had practised hours on end during high school days. One of the Malay boys spied me doing this, and with a shout tossed the ball over a ditch and a wire fence to me.

I took a shot at the basket from my considerable distance and, by an unaccountable freak of nature, it dropped through the hoop. Whoops of joy greeted this feat, and I was immediately inducted into the proceedings.

For half an hour I played with those boys and was, of course, perfectly terrible at shooting during the rest of the period. But every time I did manage to get the ball through the hoop, great was the noise and approbation.

I couldn't speak their language, nor could they understand mine, but we had a lot of fun. And this friendly,

(Concluded on Page 25, Column 1)



Save THE COST OF OVER FUSING

Ordinarily, "over fusing" is not necessary to take care of heavy starting loads because the high starting torque of Century Single Phase Motors is secured with low starting current.

They may be thrown directly across the line—generally, without the need of auxiliary current-limiting equipment.

Century Type RS Motors are especially desirable for all types of Air Conditioning Installations, Pumps and where high starting torque, frequent starting and stopping, automatic control, long life and continuous dependability are necessary operating requirements.

The brushes touch the commutator only during the starting period.

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

Century
MOTORS

UP TO 600 HORSE POWER

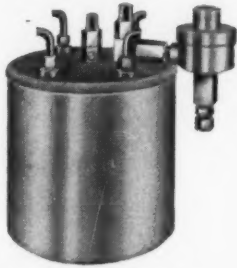
ACROSS THE LINE STARTING

Any approved switch may be used for starting Century Single Phase Motors.

REASONS FOR TEMPRITE SUPREMACY

- ★ Temprite Prevents Loss of Beer
- ★ Temprite Preserves the quality of the Beer
- ★ Temprite provides Economical Refrigeration
- ★ Temprite gives accurate temperature control

In summary, Temprite permits dispensing beer with no loss of its original quality and by doing this at a uniform and correct temperature, gives to the consumer the product he wants and builds up business for the dispenser. Temprite, furthermore, does this without loss or waste, resulting in the maximum profit from the keg. Finally, Temprite operates with the lowest possible cost for refrigeration, providing still greater profit for the user.



It is because the truth of these claims has been so definitely demonstrated that Temprite is maintaining its position of leadership in the beer cooling and dispensing field.



BUT
thousands of beer dispensers have not yet heard this story. Carry it to them and profit from the business that awaits you.

TEMPRITE PRODUCTS CORPORATION
1349 EAST MILWAUKEE AVE. - DETROIT, MICHIGAN
ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

Refrigerator Hardware

DESIGNED — to meet today's and tomorrow's demand for smartness.

ENGINEERED — to possess strength and durability along with unbelievable ease of operation.

PRODUCTION FACILITIES — to give prompt service on large volume requirements for hardware of the finest quality.

GRAND RAPIDS BRASS COMPANY
Grand Rapids, Michigan



**So Much Depends
On Tubing—Be Sure
It Is
Wolverine
You Depend On**



No refrigeration job can operate at its best efficiency, or highest satisfaction unless the copper tubing is right.

Don't tolerate defects in refrigeration tubing — dirt, porosity — roughness — moisture, etc. — you don't have to. Wolverine tubing is **always** right.

The "Wolverine" marking at intervals on every length of Wolverine Tubing tells you that it is made by the extrusion process pioneered by Wolverine. It assures you that it will be a dense, uniform, dead soft for bending — perfectly clean inside and out — perfectly dehydrated, and have a mirror-like inside finish.

You will know that any service calls you get will not be the fault of the tubing.

Many years specialization in refrigeration tubing have taught Wolverine just how to make it. Take advantage of that knowledge and experience.

Large stocks in all sizes carried for immediate delivery.

WOLVERINE TUBE CO.

SEAMLESS COPPER BRASS & ALUMINUM

1411 Central Ave.

Detroit, Mich.

H. M. ROBINS CO., Export Factor

WESTINGHOUSE

Westinghouse Electric & Mfg. Co., Mansfield, Ohio.

Model No.	ED-30	ED-40	ED-50	*ED-60	*ED-70	EDX-44	EDX-54	*EDX-67	*EDX-78	EDXF-95
Compressor Model No.	ES-3	ES-4	ES-5	ES-6	ES-7	E-122	E-122	E-123	E-123	EF-123
PRICE	Zone 1 prices—									
Retail price, installed	\$109.50	\$134.50	\$169.50	\$194.50	\$224.50	\$169.50	\$194.50	\$239.50	\$264.50	\$294.50
Cabinet finish, exterior	Dulux									

CABINET DIMENSIONS

Overall height (inches)	46 1/4	51 1/4	54 1/4	57 1/4	60 1/4	56 1/4	58 1/4	61	61 1/4	66 3/4
Overall width (inches)	24	24	27 1/4	28 1/4	29 1/4	23 1/4	26 1/4	28 1/4	31 1/4	33
Overall depth (inches)	24 1/4	24 1/4	25 1/4	26 1/4	26 1/4	26 1/4	26 1/4	27	27	28 1/4
Inside height (inches)	22 1/4	28	31	33 1/4	36	29 1/4	31 1/4	34 1/4	34 1/4	38 1/4
Inside width (inches)	18 1/4	18 1/4	20 1/4	21 1/4	23 1/4	17 1/4	20 1/4	21 1/4	25	25 1/4
Inside depth (inches)	14 1/4	14 1/4	14 1/4	15 1/4	15 1/4	15 1/4	15 1/4	16	16	17 1/4
Number of doors	1									

STORAGE CAPACITY

Net food storage (cu. ft.)	3.2	4	5	6	7	4.4	5.4	6.7	7.8	9.5
Number of shelves	2	2	2	3	4	3	3	3	3	4
Total shelf area (sq. ft.)	5.6	7.4	9.6	10.8	14.6	9.0	10.2	11.1	12.3	15.9
Cabinet finish (interior)	Porcelain									

INSULATION

Top (thickness in inches)	2 1/2	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
Sides	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4
Back	2 1/2	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
Door	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4
Bottom	3 1/4	3 1/4	4 1/4	4 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4

ICE CUBES

Number of shallow trays	2	2	3	5	5	3	3	5	5	5
Number of deep trays	0									
Total number of cubes	44	44	74	118	118	74	74	118	118	118
Total weight of cubes (lbs.)	4 1/2	4 1/2	7 1/2	12	12	7 1/2	7 1/2	12	12	12

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)										
Motor horsepower	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/6
Refrigerant in system (oz.)										
Quantity of lubricant (oz.)										
Belt circumference (inches)	No belts									
Belt width (64ths of an inch)	No belts									

WEIGHT

Net weight (lbs.)	228	244	288	337	355	316	339	383	415	460
Shipping weight (lbs.)	280	302	352	399	431	373	405	473	513	571

Model No.	E-50	*E-60	EPX-44	EPX-54	*EPX-67	*EPX-78	EPXF-95	DCD-20	DCP-20	EPX-135	EPX-200
Compressor Model No.	E-122	E-123	E-122	E-122	E-123	E-123	EF-123	D-121	D-121	A-258	A-258

PRICE	Zone 1 prices—										
Retail price, installed	\$149.50	\$169.50	\$189.50	\$229.50	\$279.50	\$309.50	\$344.50	\$ 84.50	\$ 89.50	\$484.50	\$594.50
Cabinet finish, exterior	Dulux		Porcelain					Dulux	Porcelain		

CABINET DIMENSIONS

Overall height (inches)	56 1/4	59 1/4	56 1/4	58 1/4	61	61 1/4	66 3/4	36	36	61 1/4	77 1/4
Overall width (inches)	27	28 1/4	23 1/4	26 1/4	28 1/4	31 1/4	33	22	22	48 1/4	48 1/4
Overall depth (inches)	25 1/4	26 1/4	26 1/4	26 1/4	27	27	28 1/4	22 1/4	22 1/4	30 1/4	30 1/4
Inside height (inches)	31 1/4	34 1/4	29 1/4	31 1/4	34 1/4	34 1/4	38 1/4	13 1/4	13 1/4	29 1/4	50 1/4
Inside width (inches)	20 1/4	21 1/4	17 1/4	20 1/4	21 1/4	25	25 1/4	17 1/4	17 1/4	43 1/4	40 1/4
Inside depth (inches)	15 1/4	15 1/4	15 1/4	15 1/4	16	16	17 1/4	16	16	19 1/4	18 1/4
Number of doors	1									2	4

STORAGE CAPACITY

Net food storage (cu. ft.)	5.2	6.0	4.4	5.4	6.7	7.8	9.5	2.1	2.1	13.5	20.1
Number of shelves	3	3	3	3	3	3	4	1	1	4	6
Total shelf area (sq. ft.)	10.1	11.8	9.0	10.2	11.1	12.3	15.9	2.7	2.7	24.8	37.7
Cabinet finish (interior)	Porcelain										

INSULATION

Top (thickness in inches)	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4	5 1/4	3 1/4	2 1/2	2 1/2	2 1/2	3 1/4
Sides	2 1/2	3	2 1/2	2 1/2	3 1/4	3 1/4	3 1/4	2	2	2 1/2	4 1/4
Back	2 1/2	3	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	2	2	2 1/2	3 1/4
Door	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	2 1/2	2 1/2	3 1/4	3 1/4
Bottom	3	3	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	2 1/2	2 1/2	2 1/2	3 1/4

ICE CUBES

Number of shallow trays	3	3	3	3	5	5	5	1	1	6	6
Number of deep trays	0									1	1
Total number of cubes	80	80	74	74	118	118	118	22	22	192	192
Total wt. of cubes (lbs.)	8	8	7 1/2	7 1/2	12	12	12	2 1/4	2 1/4	21	21

COMPRESSOR

Ice melting effect 24 hrs.											
Motor horsepower	1/8	1/8	1/8	1/8	1/8	1/8	1/6	1/8	1/8	1/4	1/4
Refrigerant in system											
Quantity of lubricant											
Belt circumference	No belts										
Belt width (64ths)	No belts										

WEIGHT

Net weight (lbs.)	305	339	356	381	428	465	520	185	186	611	760
Shipping weight (lbs.)	360	396	423	448	505	550	615	215	216	932	1120

*Available with Freon compressor at \$5.00 additional charge.

COMPRESSOR

Made by Westinghouse, sealed, reciprocating, direct-driven compressor located above food compartment in EDX and EPX models, below on ED models, others not given.

All compressor models listed—single cylinder (except A-258, twin cylinder), 1,750 r.p.m., 1-in. bore, 3/4-in. stroke.

Refrigerant, sulphur dioxide in all compressors except those designated "F," which use Freon. Lubricant, special brand. No shaft seal.

CABINET

Made by Westinghouse. Steel frame with special insulation. Micarta breaker strip, balloon-type gasket.

HARDWARE

Made by Westinghouse. Chromium finish.

MOTOR

Induction type made by Westinghouse. Permanently oiled.

CONDENSER

Made by Westinghouse, fan cooled, fin and tube type condenser.

EVAPORATOR

Made by Westinghouse of Sanalloy pressed metal. Temperature refrigerant control. Aluminum ice trays. Eject-o-Cube trays.

CONTROL

Westinghouse adjustable temperature control, Model No. mounted outside the cabinet. Wide-cycle defrosting with vacation cycle. Automatic reset bimetal overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: Five years.

Serviced by: Authorized Westinghouse representatives.

Replacement parts are not sold to independent service companies.

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Around the World

With George F. Taubeneck

(Concluded from Page 23, Column 5)
spontaneous action of theirs made me believe all the good things I had heard about the natural hospitableness of the Malays.

Hindus & Others

Colorful and picturesque in the midst of this commingling of Europeans, Orientals, and Eurasians, are the Indians—bearded Sikhs, Tamils, strong men from the Punjab, Bengalis, Hindustanis, Rajputans, Parsees, and what not, all wearing turbans, many ornamented with gold, some doing strange things.

When you first see a Sikh male, particularly from the rear, you may think it's a woman, a bearded lady from the circus. His long hair will be worn in a knot on top of his head, and he'll be wearing a white robe which, to Western eyes, appears like feminine garb.

But when you see a Hindu girl, then you'll know the difference. Gowned in seductively transparent and clinging muslin robes in bright pastel shades, with perhaps a bit of gold brocade, she will have golden ornaments from nostrils to ankles. Many of them pierce their nostrils, in which they wear gold figurines.

The men are the run-and-fetch-it type of laborer in the offices and do all sorts of manual and menial tasks. Some of them, educated, are busy clerks. They are hard workers, the Indians, and a great asset to the community.

There are also Arabs, Ceylonese, Japanese, Filipinos, Persians, Siamese, Armenians, Koreans, and Turks in this polyglotticity.

Americans are classed as Europeans in Singapore, as are Canadians, Russians, Danes, Australians, New Zealanders, Swedes, Norwegians, Portuguese, French, Germans, Greeks, Italians, Scotchmen, and Jews from every land. They're all there, with many whose race is almost unidentifiable.

Frank Buck and the Sultan of Johore

Topmost among the local heroes are the Sultan of Johore and FRANK BUCK, the wild animal catcher whose exploits were made famous to moviegoers via the pictures "Bring 'em Back Alive" and "Wild Cargo."

Buck catches tigers, elephants, rhinoceri, leopards, big snakes and whatnot in Malaya.

Those movies you've seen were the real thing, according to Singapore residents. He really is a fearless big game trapper, and is ready to risk his life at the sound of a snarl. He sells what he catches to zoos and circuses.

The Sultan of Johore is quite a fellow. White-haired and handsome, he is one of the greatest big game hunters of all time, they say. Tigers are his specialty, and he goes after them on foot with a rifle.

Man-eating tigers make away with dozens of natives annually. Whenever the Sultan hears of a tiger having been seen near a community he immediately speeds for the spot, a-hunting goes, and usually comes back with a new trophy. His people regard him as their protector, which he is, and worship him with genuine feeling and devotion.

The Sultanate of Johore antedates the British and even the Dutch in Malaya. In fact, Singapore was purchased by the East India Company from a Sultan of Johore. The Sultans claim direct descent from Alexander the Great, and all have been wealthy.

Current incumbent of the office, the mighty tiger hunter, has given two and a half million dollars to the British Government to be spent on the Singapore fortifications.

Johore is a constitutional monarchy under the protection of the British Empire. It is separated from the island of Singapore by a narrow strait, across which runs a causeway. Its richness derives from iron mines, rubber plantations, palm oil, fishing, and agriculture.

Ancient History

Singapore has had little history of her own. She has never tried to be a conquering hero, nor a definite type of civilization. No ruined temples or battle-scarred landmarks exist, not even for the benefit of tourists.

It has been Singapore's province to act as a bazaar, a great emporium where goods of various nations might be exchanged.

Between the famous Dragon's Teeth rocks which guard the entrance to

that magnificent harbor, in which all the ships of the world could lie at anchor (and seem to!), in centuries gone by have sailed ships bearing goods from China and Japan to be exchanged for luxuries from India, and food from verdant Java and Sumatra.

Arabs and Phoenicians came into this region to get the gold and spices and muslins which corrupted empire after empire, from that of King Solomon right down to Rome.

Recorded history of Singapore dates back not much further than 13th century A. D. when it was known as Singhapura. It was conquered and recognized; but waited until the 19th century to figure in the annals of Europe.

In 1703 it was offered as a gift to the Scotch (not the American) Alexander Hamilton; but was refused.

Not until that great Malayan developer and statesman, Sir STAMFORD RAFFLES, who had been Lieutenant-Governor of Java before the Dutch took it over, foresaw its possibilities, did Singapore come into the ken of the British.

At that time it was a pirate's den, much feared by the Chinese and seafaring traders. From the haven of its big harbor fierce Malays sailed out and attacked European vessels, Chinese junks and Indian barques, massacring the sailors and making away with cargoes.

But Raffles bought it for the British East India Co. in 1819, and set out to make it just what it is today; trading post, coaling port and center for the maritime commerce of the world.

He also foresaw the political significance of Singapore; and the day seems to have come when his prophecy that whoever held Singapore would have the key to control of the East has become an accepted fact.

Today his statues and his name confront the visitor almost everywhere one goes in Singapore and deservedly, for he is most responsible for its present developments.

Port Singapore

Singapore, as we have said, is an island. It lies about 80 miles north of the equator, and is a little more than 200 miles square. Its harbor probably compares with the best in the world, and certainly with those of San Francisco and Sydney, the best we've seen.

Boats of all descriptions come into that harbor; big white passenger liners, dirty little tramp freighters, antique Chinese junks, Japanese sampans, six-oared Malay fishing boats, sleek private yachts, full-rigged sailing boats, and whatnot.

All public wharves, dry docks, and their complements are owned and operated by a municipal Harbor Board, which is a profitable and efficient enterprise.

There are about two miles of wharves available, and more can be built if the need arises. In addition, hundreds of ships ride at anchor at all times in the roadstead. At night their lights make a lovely picture; by day their assorted sizes and shapes and smoke make an intriguing sight.

Two big cold storage companies, the Fresh Food Refrigerating Co. and the Singapore Cold Storage Co., are located near the docks and do a big business in the provisioning of both transient ships and the tables of Singapore.

Ingress into the interior of Malaya from the Singapore wharves is made via the Federated Malay States Railways, an excellent narrow gauge system which penetrates the jungle into the commercially important Malay States, making connections with Siamese railways.

Their terminal in Singapore is as handsome a railway station as any you'll see in America, with a high vaulted ceiling, impressive approach, and a floor made of colored rubber from a patented process by a local rubber firm.

Would that every big railway station had a flooring so easy on the feet and eyes as the one in Singapore!

Unique Government

Singapore has a most extraordinary municipal government, one which might be commended to the study of American cities.

Its controlling body consists of 25 commissioners, 12 of whom are appointed by the British governor, 12 appointed by civic organizations (such as the Rotary Club, Chamber of Commerce, Chinese Chamber of Commerce, Mohammedan Advisory Board and

Straits Settlement Association) and one from the civil service.

Thus these commissioners have no political ties, no party bosses to report to, no special axes to grind. They are public spirited citizens, representative of the leading elements in the industrial and commercial life of the city.

This Board of Commissioners is divided into seven committees which, in turn, supervise paid executives of the departments of health, water, electricity, gas, treasury, water, roads, sewage, fire, public vehicles and taxes.

Health Department is especially good, and is noteworthy for the success of its precautions against malaria and its infant welfare work.

Incidentally, it might be noted that Singapore is freer from flies than any city we've visited on these tours. Everybody lives and eats out-of-doors, yet one almost never sees a fly. The absence of ants and other insect life is remarkable for an Eastern town, too.

Straits Settlement policemen are for the most part Malays and Indians. They are highly trained and fearless. As a result—and give the unpolitical character of the Board of Commissioners some credit, too—Singapore is relatively free from crime.

Contrary to the expectations of most travelers it's safe to walk about in any section or street of Singapore at any hour of the day or night without protection.

Traffic policemen catch your eye from the very first. They wear a six-foot board on their backs, which acts as a stop-signal to approaching vehicles.

Seasonless Climate

So far we have only intimated that Singapore is hot and humid, in talking about air conditioning. Let us say

that it's not as bad as Java, particularly as to temperature. The point is that the humidity is *always* high, and that it's *always* warm.

There are no seasons—from the standpoints of both heat and rain in Singapore.

Rainfall averages 95 inches per year. Mean annual temperature is 82°. It is claimed that a temperature of 100° has never been recorded in Singapore. There are never any heat waves, nor any typhoons nor earthquakes.

Hottest portion of the day is between 2:30 o'clock and 4 p.m. At night it is most pleasant, with gentle breezes wafting in from the sea.

The monsoon winds provide practically the only variation in Singapore's climate.

In the days of sailing vessels these monsoons were almost as important as Singapore's strategic position in developing the importance of that port. Chinese vessels sailed down on the northeast monsoon, and back on the southwest monsoon. Those from India sailed toward Singapore on the southwest monsoon, and went home on the northeast monsoon. These winds lasted just about the right time for such journeys.

From May to October the southwest monsoon blows; bringing warmth and little rain, and ushering in the sports festivals. From November to April comes the stronger northeast monsoon, which bears rain, cool nights, many tourists and good business.

Rubber

Perhaps the most important export of Singapore is raw and fabricated rubber.

All through the Malay States rubber plantations are in intense cultivation. This rubber goes through Singapore to the outside world—as uncoagulated

latex, as sheets or crepe, or as boots, shoesoles, tires, inner tubes, rubber balls, inflated toys, hose, belting, brake fittings, ebonite, colored rubber sheeting, mats, non-creep tiles, and non-corrosive coatings.

Citizens will tell you that Singapore's prosperity depends to a considerable extent on the price of rubber.

Industrial Singapore

Because of the great flow of raw materials through its harbor, because of its easy access to fuels (oil from the interior, coal from Malaya, Sumatra, and Borneo) and most of all because of its tremendous supply of cheap Chinese, Indian, and Malay labor, Singapore is beginning to develop into an industrial city.

There are the rubber fabricatories, as we have mentioned, also tin products, soap, biscuit, pottery, beer, rattan, furniture, brick and tile, concrete piping, canned pineapple, coconut oil, cigarettes, rope, brushes, toddy (fermented palm juice, drunk by Malays), gases, aluminum utensils steel furniture, fertilizers, and teak and cane carpenter work.

Fishing is an important industry in and around Singapore. The Malays are great fishermen, and so are the Chinese. Japanese fishing sampans also supply the Singapore market.

These fishermen supply not only Singapore, but all the Malay States with refrigerated and salt fish, which is, after rice, probably the chief article of diet of these people.

Next to rubber, tin is probably the most important export product of Singapore. Great tin mines exist in interior Malaya, also in neighboring Siam and Burma, and the Dutch East Indies. This ore comes to the Straits Trading Co. Ltd., Singapore, for smelting and refining.



Millions of Parched Throats Demand Ice Cubes—in a Hurry

These hot days, full-page advertisements in leading magazines are reminding (with a smile) millions of readers about the modern method of getting ice cubes in a hurry... from Flexible Rubber Trays or Grids.

Among them are your best prospects whose parched throats urge them to buy a mechanical refrigerator now and enjoy the advantages of ice cubes in a hurry... at the refrigerator.

A survey among recent refrigerator

purchasers showed 99% expressing a definite preference for the convenience of Flexible Rubber Trays or Grids.

Give your salesmen the important advantage of demonstrating how ice cubes pop out in a split second... one at a time or a whole trayful... full-sized, cold, and dry. Cash in on the demand for ice cubes in a hurry. Insist that the refrigerator you sell comes factory equipped with a Flexible Rubber Tray or Grid in every ice compartment.

THE INLAND MANUFACTURING COMPANY • DAYTON • OHIO

A TRULY MODERN REFRIGERATOR SHOULD HAVE A
FLEXIBLE RUBBER TRAY OR GRID
IN EVERY ICE COMPARTMENT

M & E

Merchant & Evans Co., Philadelphia, Pa.

Model No.	4S	66S	91S
Compressor Model No.	100-D	100-D	115-S

PRICE

Retail price, installed	Porcelain and Dulux
Cabinet finish (exterior)	Porcelain and Dulux

CABINET DIMENSIONS

Overall height (inches)	53½	65	70½
Overall width (inches)	23½	30½	33½
Overall depth (inches)	21½	24	24
Inside height (inches)	26½	34	39½
Inside width (inches)	19½	23½	26½
Inside depth (inches)	16	16	16
Number of doors	1		

STORAGE CAPACITY

Net food storage (cu. ft.)	4.00	6.66	8.95
Number of shelves	3	5	6
Total shelf area (sq. ft.)	8.5	12.73	15.38
Cabinet finish (interior)	Porcelain		

INSULATION

Top (thickness in inches)	2	3	3
Sides	2	3	3
Back	2	3	3
Door	2	3	3
Bottom	2	3	3

ICE CUBES

Number of shallow trays	2	2	3
Number of deep trays	0	1	1
Total number of cubes	56	84	112
Total weight of cubes (lbs.)	4½	8½	11

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	110	110	130
Motor horsepower	1/6	1/6	1/5
Refrigerant in system (lbs.)	2	2	1½
Quantity of lubricant (oz.)	8	8	8
Belt circumference (inches)	36	36	36
Belt width (64ths of an inch)	42	42	42

WEIGHT

Net weight (lbs.)			
Shipping weight (lbs.)			

COMPRESSOR

Made by Merchant & Evans, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. 100-D—single cylinder, 625 r.p.m., 1½-in. bore, 1¼-in. stroke.

Compressor Model No. 115-S—twin cylinder, 525 r.p.m., 1½-in. bore, 1¼-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, Suniso No. 2. Shaft seal, diaphragm.

CABINET

Made by Seeger Refrigerator Co. Metal frame with Dry-Zero insulation, bakelite breaker strip, rubber gasket.

HARDWARE

Made by — of cast brass with chrome finish.

MOTOR

Repulsion-induction type made by Wagner. Oil every 6 mos.

CONDENSER

Made by Long Mfg. Co., fan cooled, fin-tube radiator type.

EVAPORATOR

Made by McCord Radiator & Mfg. Co. of copper. Dry expansion refrigerant control. Mayson or Aminco expansion valve. Aluminum ice trays.

CONTROL

Made by Tagliabue, adjustable temperature control, Model R-18, mounted inside the cabinet. Manual defrosting, overload protector.

POLICY

Guarantee on cabinet:

Guarantee on system: One year.

Serviced by:

Replacement parts are sold to independent service men.

GAFFERS & SATTTLER

Gaffers & Sattler, Los Angeles, Calif.

Model No.	50	60	65	70	80
Compressor Model No.	T	T	T	T	T

PRICE

Retail price, installed	\$144.50	\$174.50	\$199.50	\$224.50	\$249.50
Cabinet finish, exterior	Lacquer				

CABINET DIMENSIONS

Overall height (inches)	56½	58	56½	62½	66½
Overall width (inches)	24½	27½	26½	31½	31½
Overall depth (inches)	23½	23½	23	23½	23½
Inside height (inches)	25½	27½	27	31	35½
Inside width (inches)	18½	21	21	23½	23½
Inside depth (inches)	16½	16½	18	16½	16½
Number of doors	1				

STORAGE CAPACITY

Net food storage (cu. ft.)	4	5	5.4	6.5	7.5
Number of shelves	3	6	4	5	7
Total shelf area (sq. ft.)	7.8	10.6	10.0	13.4	15.3
Cabinet finish (interior)	Porcelain				

INSULATION

Top (thickness in inches)	3	3½	2½	3½	3½
Sides	3	3	2½	3½	3½
Back	3½	3½	2½	3½	3½
Door	3½				
Bottom	3	3½	2½	4	4

ICE CUBES

Number of shallow trays	2	3	3	3	4
Number of deep trays	0				
Total number of cubes	56	84	84	84	112
Total weight of cubes (lbs.)	4	6	6	6	8

COMPRESSOR

Ice melting effect 24 hrs. (lbs.) 130

Motor horsepower 1/6

Refrigerant in system (lbs.) 4½

Quantity of lubricant (pts.) 1

Belt circumference (inches) 34

Belt width (64ths of an inch) 34

Weight (lbs.) 385 430 400 485 525

Shipping weight (lbs.)

COMPRESSOR Made by Gaffers & Sattler, open, reciprocating, belt-driven compressor located below food compartment. Shaft seal, diaphragm type.

Compressor Model T—twin cylinder, 320 r.p.m., 1½-in bore, 1¼-in stroke.

Refrigerant, sulphur dioxide. Lubricant, Sun Oil No. 2.

CABINET Made by Gaffers & Sattler. Spruce frame with Zerocel (mineral wool) insulation. Odorless Bakelite breaker strip, Goodrich balloon-type rubber gasket.

HARDWARE Made by National Lock and Winters & Crampton. Brass, chrome-plated finish.

MOTOR Capacitor-type made by General Electric. Oil annually.

CONDENSER Made by Bush Mfg. Co., fan cooled, single-pass type condenser.

EVAPORATOR Made by Mullins, welded steel stamping. Low-side float refrigerant control. Aluminum ice trays. Lift-release; one rubber tray.

CONTROL General Electric adjustable temperature control, Model B-15, mounted inside the cabinet. Semi-automatic defrosting. Hand reset solder pot overload protector.

POLICY Guarantee on cabinet: One year.

Guarantee on system: One year—5-year protection plan.

Serviced by: Factory.

Replacement parts are not sold to independent service companies.

SPECIAL FEATURES Automatic belt tightener.

TRUSCON

Truscon Steel Co., Detroit, Mich.

Model No.	T-436	T-736	T-936
Compressor Model No.	C2-16	C2-16	C2-20

PRICE

Retail price, installed	\$119.50	\$199.50	\$249.50
Cabinet finish, exterior	Lacquer		

CABINET DIMENSIONS

Overall height (inches)	54½	58	61½
Overall width (inches)	23½	30½	32½
Overall depth (inches)	23	26½	26½
Inside height (inches)	26½	30	33½
Inside width (inches)	19½	23½	26½
Inside depth (inches)	16½	19½	18½
Number of doors	1		

STORAGE CAPACITY

Net food storage (cu. ft.)	4.5	7.10	9.01
Number of shelves	3	4	5
Total shelf area (sq. ft.)	8.5	14.0	17.4
Cabinet finish (interior)	Porcelain		

INSULATION

Top (thickness in inches)	2	3	3
Sides	2	3	3
Back	2	3	3
Door	2½	3	3
Bottom	2	3½	3½

ICE CUBES

Number of shallow trays	3	2	2
Number of deep trays	0	1	2
Total number of cubes	63	98	126
Total weight of cubes (lbs.)	6	9	11

COMPRESSOR

Ice melting effect 24 hrs. (lbs.) 115 115 138

Motor horsepower 1/6 1/6 1/5

Refrigerant in system (lb.) 1 1 1

Quantity of lubricant (pt.) 7/8 7/8 7/8

Belt circumference, outside (in.) 35½

Belt width (64ths of an inch) 37

WEIGHT Net weight (lbs.) 243 352 367

Shipping weight (lbs.) 279 375 425

COMPRESSOR Made by Copeland, open, reciprocating, belt-driven compressor located below food compartment. Bellows shaft seal.

Compressor Model No. C2-16—twin cylinder, 420 r.p.m., 1½-in. bore, 1¼-in. stroke.

Compressor Model No. C2-20—twin cylinder, 490 r.p.m., 1½-in. bore, 1¼-in. stroke.

Refrigerant, methyl chloride. Lubricant, Suniso.

CABINET Made by Truscon. Steel frame with Thermocraft insulation, Panelyte breaker strip, rubber gasket.

HARDWARE Made by Grand Rapids Brass. Brass, chromium finish.

MOTOR Capacitor-start type made by Delco and Emerson. Oil semi-annually.

CONDENSER Made by Long Mfg. Co., fan cooled, finned tube condenser.

EVAPORATOR Made by Mullins of steel, porcelain coated, dry expansion type evaporator. Detroit Lubricator expansion valve refrigerant control. Aluminum ice trays. Rubber tray in T-736 and T-936.

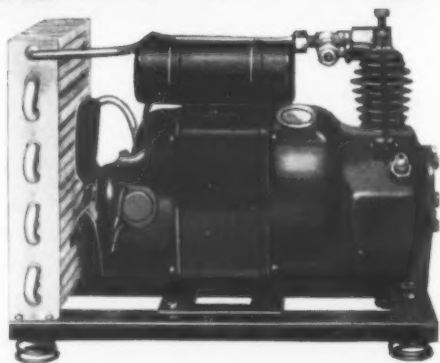
CONTROL Cutler-Hammer and Penn adjustable temperature control Model No. 9502 (Cutler-Hammer), 201 (Penn), mounted inside the cabinet. Wide-cycle defrosting with vacation cycle. (Cutler-Hammer) hand reset solder pot, and (Penn) hand reset bimetal overload protector.

POLICY Guarantee on cabinet: One year.

Guarantee on system: One year warranty—four-year replacement contract.

Serviced by: Distributors and dealers.

Replacement parts are sold to independent service companies in some territories.

KELLOGG**Dependable is the Word . . .**

Whether your demand for household electric refrigeration condensing units is for original installation or for the replacement of units of other makes, it will pay you to investigate the new, light, compact, vibrationless Kellogg Highside.

After four years of experience with these units, we can safely assure you of more refrigeration for less current consumption than you have been taught to expect from a 1/6 H.P. unit.

It is small enough to fit into the compressor compartment of almost any domestic refrigerator box.

Kellogg can also supply commercial sizes from 1/4 to 5 H.P.

Write for your copy of the new Kellogg catalog and price list before you place your next order for highsides.

KELLOGG COMPRESSOR AND MANUFACTURING CORPORATION

300 Humboldt St. ROCHESTER, NEW YORK U.S.A.

Competitive Models Are Put on Display By Distributor

DENVER—George S. Conley, 635 15th St., distributor and retailer for Gibson refrigerators, finds a display of representative models of several makes other than the one he distributes a valuable sales aid.

"The plan serves a dual purpose," Mr. Conley says. "It takes care of the type of prospect who has his mind set on one make, for if we see that it is impossible to sell our own make, the unit that has been purchased by predetermination is offered."

"More important, however, is the actual on-the-floor comparison possible with our display. We point our entire sales talk toward a description of Gibson, and the competitive models give us valuable illustrations for the talk."

Simply talking about refrigerators in a comparative way without having demonstrators is like having to sell one without a floor model, according to Mr. Conley.

Westinghouse Declares Dividend of \$1

NEW YORK CITY—Directors of last Westinghouse Electric & Mfg. Co. last week raised the company's dividend rate, with declaration of a \$1 payment on the common stock.

In the preceding two quarters, dividends of 75 cents were declared. In August and November, 1935, payments of 50 cents were made.

The latest disbursement is payable Aug. 31, to stock of record July 31. Directors also ordered a regular quarterly dividend of 87½ cents on the preferred stock, with the same record and payable dates.

Air Conditioning

Adoption of Vapor Compression Systems For Heat Pump Are Explained by Prof. Chamberlain to A.S.R.E. & A.S.H.V.E.

BUCK HILL FALLS, Pa.—New facts about the principles and practice of the heat pump, evolved from recent research work, were outlined by Prof. C. W. Chamberlain of Michigan State College at the joint A.S.R.E.-A.S.H.V.E. meeting here last Tuesday.

Vapor compression systems have rapidly replaced those using air or other nearly perfect gases as refrigerants, Prof. Chamberlain said. In practically all attempts to heat interiors by mechanical means, vapor has been used as a working medium. Example of such a heat pump is the installation of the Southern California Edison Co. in Los Angeles, Calif. Four 200-hp. motor driven compressors, operating on the ammonia cycle, cool the building in summer and heat it in winter as long as the temperature is above 42° F. Below that temperature the building is heated by electric resistance heaters.

Under favorable conditions water may be used as the source of heat, declared Prof. Chamberlain. There are some favorable locations, such as Columbus, Ohio, where the water from private wells could be used as a source of heat in winter and for cooling purposes in summer.

At the present time such waters are used for cooling only. They could be used for the double purpose of heating and cooling by pumping water from the upper level of the wells in winter, pumping heat from it and returning the cold water to the bottom of the water-bearing stratum. For

summer cooling the water should be pumped from the bottom of the wells and returned to the upper surface.

Wells now being used for cooling purposes could be improved by using their waters as a source of heat for winter heating so long as their temperature was not lowered too near that of the maximum density of water. If the latent heat of water be used the ice formed during the winter months in heating a 14,000 ft. house in Washington, D. C., would form a pile half as large as the house.

Prof. Chamberlain pointed out that the amount of heat that can be reclaimed from the ventilating air discharged from the interior is small compared with the total required to be pumped. This large amount of heat must be abstracted from the cold outside air.

The warm ventilating and the cold outside air in their passage over the heat abstracting coils will both deposit frost on the coils. Continual removal of this frost would be necessary for efficient coil operation.

This serious limitation is met whenever the outdoor temperature falls below 42° F. and by itself would condemn the use of the ammonia cycle for heat pumps in the vicinity of Lansing, Mich.

Prof. Chamberlain said that calculations showed that at 2.65 cents per kwh. it costs three times as much to heat a dwelling with a heat pump as with a furnace.

Water Works Getting Ready to Handle Air-Conditioning Load, Morrow Reports to Engineers

BUCK HILL FALLS, Pa.—Water works officials are already making special preparations for increased demands caused by air conditioning, and there will in all probability be an adequate supply, although the time at which the peak demand falls coincides with peak demands from other sources, it was brought out in a paper by D. C. Morrow of the Uniontown Water Co., Washington, Pa., prepared for the joint A.S.R.E.-A.S.H.V.E. session here.

"Types of water supply works vary in their essential elements from a system obtaining its supply from a mountain stream of clear pure water, the flow of which is ample at all times and having an intake at such an elevation that the flow through short transmission mains to the distribution system is by gravity, to one where hard surface water impounded in reservoirs flows through long transmission mains to a purification and pumping station where it is filtered and softened and pumped against a high head to distribution reservoirs or tanks from which it flows by gravity to the distribution system," Mr. Morrow explained.

"Between these extreme types are systems having only impounding reservoirs, transmission mains and distribution systems; systems having impounding reservoirs, filter plants, transmission mains and distribution systems; systems supplied by well waters which do not require filtration but must be pumped either directly into the distribution system or to distribution reservoirs (some well waters are softened); and systems having large lakes or rivers as sources of supplies, the water from which must be filtered and in some cases softened, and pumped either directly to the distribution system or to distribution reservoirs."

To experienced water works engineers, Mr. Morrow declares, it is obvious that the values and operating costs of these systems will vary widely. Since the proper charge for water service is dependent upon plant value and operating costs, it is equally manifest that there must be a variation in cost of service to consumers, from low rates in the cases of strictly gravity systems to high rates in the cases of the most complex systems.

"In the larger cities of this country the average daily per capita consumption ranges from less than 100 gal. to nearly 300 gal., while in the smaller cities and towns the range is from less than 25 gal. to 500 gal. This latter high rate is due to heavy industrial demand, careless and extravagant use of water and to leakage in the distribution pipe systems.

"Experience indicates that maxi-

mum average daily rates during the season of high demand may exceed the daily averages, which are based on annual consumption, by more than 50%, while the peak hour may exceed the daily rate by more than 125%."

Mr. Morrow thinks it unfortunate that the extra burden brought about by air conditioning will be imposed during the season when water supply systems are already carrying peak loads. Then too, the load factor chargeable to air cooling will be low because of the demand during the day. In general, the peak demand will closely coincide with those now carried. Hence they cannot be compensatory.

This means that the capacities of all elements of water supply systems, must be increased enough to carry the load imposed by the maximum demand. In systems where the water is filtered and pumped the extra capacities of filters, pumps, force mains and distribution mains may be idle more than 70% of the year.

"L. Logan Lewis, chief engineer of the Carrier Engineering Corp., in a paper presented before the New York Section of the American Water Works Association, estimated a maximum demand of 350 g.p.d. per capita and a probable use of 140 g.p.d. per capita for a season of 120 days as air conditioning requirements for water when neither cooling towers nor evaporative condensers are used," said Mr. Morrow.

"By using water cooling towers or evaporative condensers the estimated demand drops to a maximum per capita demand of 140 g.p.d. and a probable per capita use of 60 g.p.d. for a season of 120 days.

"The demand for water used in air cooling without the use of cooling towers or evaporative condensers will not be discussed because it would be economically unsound for the purchaser of water to pay the price which would necessarily be charged due to the cost of additional facilities capable of supplying the maximum demand for the comparatively short air cooling season.

"Assuming a normal per capita daily consumption of 100 gal., a seasonal maximum demand of 150 gal., an air conditioning maximum demand of 140 g.p.d. per capita and 100% air conditioning, the increase of plant capacity would be more than 90%."

"It seems safe to predict that the extra burden will fall upon water supply systems, and since water works officials usually have anticipated additional demands before they were realized, it is believed that water for air cooling purposes will be available when water economizing devices are used."

Carrier Predicts Public Acceptance of Residential Air Conditioning by 1941

BUCK HILL FALLS, Pa.—Complete public acceptance of residential air conditioning by 1941 was the prediction made by Willis H. Carrier, chairman of the board of Carrier Engineering Corp., in his talk on "The Progress in Air Conditioning in the Last Quarter Century" at the joint session of the American Society of Heating and Ventilating Engineers and the American Society of Refrigeration Engineers held here last week.

The 10 years just passed Mr. Carrier referred to as notable for the extension of the air-conditioning industry into the field of cooling for comfort on a large scale.

The speaker traced the development of the industry from its first recognition by mechanical engineers a quarter of a century ago, in 1911, when he was invited to speak before a meeting of the American Society of Mechanical Engineers on air conditioning. He called that speech, he related, "Rational Psychrometric Formulae—Their Relation To the Problems of Meteorology and of Air Conditioning."

A later paper, "Air Conditioning Apparatus—Principles Governing Its Application and Operation," he said, gave a complete picture of the theoretical and practical aspects of air conditioning as practised then by the Carrier Air Conditioning Co., subsidiary of Buffalo Forge Co.

Carrier was, in 1911, one of the three concerns wholly or partially in the air-conditioning field. S. W. Cramer, Charlotte, N. C., in the textile field, and Warren Webster & Co., Camden, N. J., had also started air-conditioning departments, he stated.

In that introductory paper to air conditioning, Mr. Carrier said he

spoke of the economic importance of the new findings to many varied industries, and added that in many other industries, such as lithographing, and the manufacture of candy, bread, high explosives, and photographic films, and the drying and preparing of delicate hygroscopic materials such as macaroni and tobacco, the question of humidity is equally important."

Mention was also made in this publication of the desirability of the application of air conditioning to mines, which, Mr. Carrier says, indicated the commercial status of air conditioning 25 years ago.

In his talk, Mr. Carrier referred to the fact that at the time that original paper was delivered, little use was made of cooling coils or cooling surfaces in air conditioning.

"In reality," he stated, "this method has played a part of little importance until the last few years. Today its increasing commercial significance has been made possible by two great advancements, first, in improved surfaces, and second, the introduction within the last five years of new refrigerants."

Up to 1911 and for 10 years thereafter, Mr. Carrier related, air conditioning was employed almost entirely in industry. "It was not realized previously the tremendous effect it was to have later as applied to requirements of human comfort and particularly in summer cooling in connection with refrigeration. For this reason, the public has heard little of it until recent years."

Having discussed the status of the art 25 years ago, the speaker enumerated the improvements that have taken place since that date, namely:

scientific measurement of human comfort, improved heat transmission surfaces for heating and cooling, improved methods of heat removal including new and improved types of refrigerating machines, and new refrigerant media.

Improvements in the method and apparatus for air distribution and humidity control, improvement and simplification in the method of dust removal, adequate lowering of objectionable sound level of ventilation and air conditioning systems, development of reliable low cost unitary cooling and air conditioning equipment, and extension of the application of air conditioning to new fields, were the other developments named.

"If a single factor were to be chosen as having the most outstanding influence in bringing about the widespread adoption of air conditioning and summer cooling existing today, it is probable," Mr. Carrier stated, "that the development of new and improved refrigerants would be given this honor."

Although the public's experience with air conditioning in the theaters within the past 15 years has facilitated its acceptance of comfort cooling, perhaps the greatest aid to public acceptance, the speaker said, has been the wholesale adoption of air conditioning by the railroads during the last five years.

"The rapidly growing and widespread use of air conditioning is being brought about by the advance in design and materials which makes it possible to demonstrate to the small commercial user that air conditioning is a paying investment," he declared.

Although installations in homes and private offices are not yet numerous, the recent contribution of the portable air conditioner which can be plugged into a light socket without any other connection should help this, according to Mr. Carrier.

To protect YOUR BUSINESS and profits, we are telling this story to the public and to your large-building prospects

WHAT IS "AIR CONDITIONING"?
To be sure you're getting true air conditioning, check these services before you buy:

- "SUMMER AIR CONDITIONING"**
 - 1. Clean and disinfect the air to remove dust and germs.
 - 2. Filter and purify the air.
 - 3. Circulate the air.
- "YEAR-ROUND AIR CONDITIONING"**
 - 1. Control and dehumidify the air to remove moisture.
 - 2. Filter and purify the air.
 - 3. Circulate the air.
- "WINTER AIR CONDITIONING"**
 - 1. Heat the air.
 - 2. Humidify the air.
 - 3. Circulate the air.

There are six main types of air conditioning systems, each with its own advantages and disadvantages. The Carrier Engineering Corp. is the world's largest manufacturer of air conditioning equipment. For more information, contact your local Carrier representative or write to the Carrier Engineering Corp., Buffalo, N.Y.

ACMA
AIR CONDITIONING MANUFACTURERS' ASSOCIATION

INADEQUATE, misrepresented equipment can destroy public faith in air conditioning.

Appliances which are called "air conditioners," yet which do not meet the minimum requirements of true air conditioning, promise the buyer more than can be fulfilled. However efficiently they may serve their limited purposes, they lower public confidence in and appreciation of true air conditioning—injuring your business and ours.

Because of the tremendous sales potential in air conditioning, it is essential that the public should not be confused and disappointed by equipment which does not provide the values justly expected from a product called an "air conditioner."

We invite your cooperation in our efforts to educate the public in the true meaning of air conditioning.

This advertisement is sponsored jointly by the Air Conditioning Manufacturers' Association and by Kinetic Chemicals, Inc.

THIS MESSAGE IS BEING BROUGHT TO THE ATTENTION OF 698,972 PEOPLE THROUGH THE FOLLOWING PUBLICATIONS:

Time	625,292	Architectural Forum	21,713
Chain Store Age	15,123	Federal Architect	2,300
American Restaurant	12,437	Building & Building Management	2,462
Retailing	6,499	Building Modernization	13,146

TOTAL CIRCULATION 698,972



STARR-FREEZE

The Starr Co., Richmond, Ind.

Model No.	T	R	N	Q	G	H
Compressor Model No.	AT	AR	J3	J7	B0	B3

PRICERetail price, installed..... Prices quoted only to the trade
Cabinet finish, exterior..... Enamel or Porcelain**CABINET DIMENSIONS**

Overall height (inches).....	50%	55%	58%	57½	67	67½
Overall width (inches).....	20½	24½	33	37½	49½	49½
Overall depth (inches).....	20	22½	26½	24	26	25½
Inside height (inches).....	25½	27½	29½	30	35	52½
Inside width (inches).....	15½	19½	25½	31	42½	42½
Inside depth (inches).....	13½	16½	16½	19½	16½	16
Number of doors.....	1	1	1	2	2	4

STORAGE CAPACITY

Net food storage (cu. ft.).....	2.85	4	6.1	7.18	12.1	16
Number of shelves.....	3	5	5	6	6	7
Total shelf area (sq. ft.).....	4.4	9	13	11.75	20.75	28.16
Cabinet finish (interior).....	Porcelain					

INSULATION

Top (thickness in inches).....	2	3	3	3½	3½	3½
Sides.....	2	2½	3	3½	3½	3½
Back.....	2	2½	3	3½	3½	3½
Door.....	2	2½	3	3½	3½	3½
Bottom.....	2	2½	3	3½	3½	4

ICE CUBES

Number of shallow trays.....	2	2	4	3	6	10
Number of deep trays.....	0	0	0	1	1	2
Total number of cubes.....	30	56	112	140	224	336
Total weight of cubes (lbs.).....	2.6	3.9	10	12.5	20	30

COMPRESSOR

Ice melting effect 24 hrs.....	91	91	154	185	255	302
Motor horsepower.....	1/6	1/6	1/6	1/6	1/4	1/3
Refrigerant in system (lbs.).....	2	2½	1½	1½	3½	3½
Quantity of lubricant (oz.).....	15	15	10	10	22	22
Belt circumference (inches).....	35	40	40	40	40	40
Belt width (64ths of an inch).....	44					

WEIGHT

Net weight (lbs.).....	200	265	370	446	608	615
Shipping weight (lbs.).....	278	368	472	585	760	824

COMPRESSOR

Made by Starr, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model Nos. AT and AR—single cylinder, 300 r.p.m., 1.64-in. bore, 1.625-in. stroke.

Compressor Model No. J3—twin cylinder, 500 r.p.m., 1½-in. bore, 1½-in. stroke.

Compressor Model No. J7—twin cylinder, 600 r.p.m., 1½-in. bore, 1½-in. stroke.

Compressor Model No. B0—twin cylinder, 300 r.p.m., 1.64-in. bore, 1.625-in. stroke.

Compressor Model No. B3—twin cylinder, 400 r.p.m., 1.64-in. bore, 1.625-in. stroke.

Refrigerant, SO₂ in AT and AR; CH₃Cl in J3, J7, B0, and B3.

Lubricant, special white refrigerant oil (315 vis.). Shaft seal, bellows.

CABINET

Made by Starr. Wood frame with Zilem slabs, hydrolene sealed, insulation, black walnut breaker strip, air-cushion rubber gasket.

HARDWARE

Made by Grand Rapids Brass and Winters & Crampton. Chrome finish.

MOTOR

Condenser type in models T, R, N, and Q; repulsion-induction type in G and H, made by Leland. Oil every four months.

CONDENSER

Made by Starr, fan cooled, finned tube condenser.

EVAPORATOR

Starr coiled copper tubes. Detroit Lubricator expansion valve refrigerant control.

Aluminum ice trays.

CONTROL

Cutler-Hammer adjustable temperature control, Model 9502, mounted inside the cabinet. Semi-automatic defrosting. Automatic reset bimetal overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year.

Serviced by: Jobber or dealer.

Replacement parts are sold to independent service companies.

APEX

Apex Electric & Mfg. Co., Cleveland, Ohio.

Model No.	A-430	A-600	A-650	A-785
Compressor Model No.	RG5	RG5	RG5	RG6

PRICERetail price, installed..... Zone A Prices
Cabinet finish, exterior..... Dulux**CABINET DIMENSIONS**

Overall height (inches).....	51½	54½	55½	59½
Overall width (inches).....	23½	28½	32½	32½
Overall depth (inches).....	22½	24½	25½	25½
Inside height (inches).....	26	28½	27	32½
Inside width (inches).....	19	22½	25½	25½
Inside depth (inches).....	16½	18½	18½	18½
Number of doors.....	1			

STORAGE CAPACITY

Net food storage (cu. ft.).....	4.30	6.00	6.50	7.85
Number of shelves.....	3	3	2½	3½
Total shelf area (sq. ft.).....	9.3	12.1	12.4	16.3
Cabinet finish (interior).....	Porcelain			

INSULATION

Top (thickness, inches).....	2	2½	3	3
Sides.....	2	2½	3	3
Back.....	2	2½	3	3
Door.....	2	2½	3	3
Bottom.....	2½	2½	3½	3½

ICE CUBES

Number of shallow trays.....	2	2	2	4
Number of deep trays.....	0	1	1	1
Total number of cubes.....	56	87	87	135
Total wt. of cubes (lbs.).....	4.4	6.6	6.6	10.6

COMPRESSOR

Ice melting effect 24 hrs.....	90	110	110	135
Motor horsepower.....	1/6	1/5	1/5	1/5
Compressor speed r.p.m.....	460	520	520	350
Refrigerant in system.....	4½ to 5½ lbs.			
Amount of lubricant oz.....	10	10	10	14
Belt circumference (in.).....	38½			
Belt width (64ths).....	40			

WEIGHT

Net weight (lbs.).....	285	310	340	370
Shipping weight (lbs.).....	298	348	408	440

COMPRESSOR

Made by Apex, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. RG5—single cylinder, 460 r.p.m. on model A-430 and 520 r.p.m. on models A-600 and A-650, 1½-in. bore, 1½-in. stroke.

Compressor Model No. RG6—twin cylinder, 350 r.p.m., 1½-in. bore, 1½-in. stroke. May be installed in models A-600 and A-650 at nominal additional cost.

Refrigerant, sulphur dioxide. Lubricant, Sun Oil Co.

Shaft seal, balanced.

CABINET
Made by Rex Mfg. Co. Wood and steel frame with Balsam Wool insulation, Tylac breaker strip, Miller rubber gasket.**HARDWARE**
Made by National Lock Co. and Winters & Crampton. Chrome-plated finish.**MOTOR**

Capacitor type made by Apex, Delco, and G-E.

Oil every 6 months.

CONDENSER

Long Mfg. Co., fan cooled, finned tube condenser.

EVAPORATOR

Made by Mullins Mfg. Co., porcelain on pressed steel. Low side float refrigerant control. Aluminum ice trays with one rubber tray in A-600, A-650, A-785. Tray-Jack release.

CONTROL
Penn adjustable temperature control, type 201, model TAC and TADDC, mounted inside the cabinet. Wide-cycle defrosting with vacation cycle on models A-430 and A-600.

Semi-automatic defrosting with vacation cycle on models A-650 and A-785. Hand reset bimetal overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year with four years additional available at slight extra charge.

Serviced by: Authorized dealers and factory branches.

Replacement parts are sold to approved independent service companies.

SPECIAL FEATURES

Acid resisting porcelain bottom. Electric light on models A-600, A-650, A-785. Shelf-X shelves, vegetable and bottle storage on A-650, A-785. Set consisting of "Food Finder" drawer, vegetable crisper, three economy dishes, and refrigerator set available for A-650, A-785 at nominal extra cost.

Dealer Finds Way to Overcome Price Argument

LA GRANGE, Ill.—The Carey Electric Co., Westinghouse dealer here, has found a way to stop the price-conscious prospect. When people come into the store and won't buy because they are beset with notions of less expensive competitive boxes, they are shown a wall placard containing John Ruskin's quotation: "There's hardly anything in the world that some man cannot make a little worse and sell a little cheaper; and the people who consider price only are this man's lawful prey."

A complete sales story, covering all the Westinghouse features, is then presented. According to officials, the process banishes the price obstacle and sells refrigerators.

Westinghouse Promotion Gives Specifications Of Refrigerators

MANSFIELD—New dealer promotional folder just issued by Westinghouse Electric & Mfg. Co., contains complete specifications for its Golden Jubilee, Golden Jubilee deluxe, and special lines of electric refrigerators, and pictures and selling features of all models.

An illustrated chart is provided for the prospect's use in comparing features of the Jubilee line with competitive refrigerators.

ZEROZONE

Zerozone Refrigeration Co., Detroit, Mich.

Model No.	Z-436	Z-736	Z-936
Compressor Model No.	C2-16	C2-16	C2-20

PRICERetail price, installed..... \$119.50 \$199.50 \$249.50
Cabinet finish, exterior..... Lacquer**CABINET DIMENSIONS**

Overall height (inches).....	54½	58	61½
Overall width (inches).....	23½	30½	32½
Overall depth (inches).....	23	26½	26½
Inside height (inches).....	26½	30	33½
Inside width (inches).....	19½	23½	26½
Inside depth (inches).....	16½	19½	18½
Number of doors.....	1		

STORAGE CAPACITY

Net food storage (cu. ft.).....	4.5	7.10	9.01
Number of shelves.....	3	4	5
Total shelf area (sq. ft.).....	8.5	14.0	17.4
Cabinet finish (interior).....	Porcelain		

INSULATION

Top (thickness in inches).....	2	3	3
Sides.....	2	3	3
Back.....	2	3	3
Door.....	2½	3	3
Bottom.....	2	3½	3½

ICE CUBES

Number of shallow trays.....	3	2	2
Number of deep trays.....	0	1	2
Total number of cubes.....	63	98	126
Total weight of cubes (lbs.).....	6	9	11

COMPRESSOR

Ice melting effect 24 hrs. (lbs.).....	115	115	138
Motor horsepower.....	1/6	1/6	1/5
Refrigerant in system (lb.).....	1	1	1
Quantity of lubricant (pt.).....	7/8	7/8	7/8
Belt circumference, outside (in.).....	35½		
Belt width (64ths of an inch).....	37		

WEIGHT

Net weight (lbs.).....	280	335	370
Shipping weight (lbs.).....			

COMPRESSOR

Made by Zerozone, open, reciprocating, belt-driven compressor located below food compartment. Bellows shaft seal.

Compressor Model No. C2-16—twin cylinder, 420 r.p.m., 1½-in. bore, 1½-in. stroke.

Compressor Model No. C2-20—twin cylinder, 490 r.p.m., 1½-in. bore, 1½-in. stroke.

Refrigerant, methyl chloride. Lubricant, Suniso.

CABINET
Made by Truscon. Steel frame with Thermocraft insulation, Panelyte breaker strip, rubber gasket.**HARDWARE**
Made by Grand Rapids Brass. Brass, chromium finish.**MOTOR**

Capacitor-start type made by Delco and Emerson. Oil semi-annually.

CONDENSER

Made by Long Mfg. Co., fan cooled, finned tube condenser.

EVAPORATOR

Made by Mullins, of steel, dry expansion type evaporator. Detroit Lubricator expansion valve refrigerant control.

Aluminum ice trays. Rubber tray in Z-736 and Z-936.

CONTROL
Cutler-Hammer and Penn adjustable temperature control Model No. 9502 (Cutler-Hammer), 201 (Penn), mounted inside the cabinet. Wide-cycle defrosting with vacation cycle. (Cutler-Hammer) hand reset solder pot, and (Penn) hand reset bimetal overload protector.**POLICY**
Guarantee on cabinet: One year.

Guarantee on system: One year warranty—four-year replacement contract.

Serviced by: Distributors and dealers.

Replacement parts are sold to independent service companies in some territories.

Class 9100 Regulators With MANUAL CUT-IN LEVER

Lever raised vertically to lock contacts closed.

To close contacts lever is pressed down.

The special external manual cut-in lever, pictured, is available in all 9100 Regulator types, whether pressure or temperature, with or without overload protection and high pressure cutout.

The function of the lever is to allow starting of the refrigerating cycle in advance of its normal automatic cut-in point. If desired, the control contacts may be locked in to assure continuous duty, but locking in does not prohibit the operation of the overload mechanism or high pressure safety cutout.

Export Dept., Regulator Division, H. M. Robins Company, 120 Madison Ave., Detroit, Mich., U. S. A.

SQUARE D EVERYWHERE
SQUARE D COMPANYREGULATOR DIVISION, DETROIT, MICHIGAN
WESTERN DIVISION, LOS ANGELES, CALIFORNIA
SQUARE D COMPANY, CANADA LTD., TORONTO, ONTARIO**Hello, U.E.I.?**

Can You Furnish me a

TRAINED**REFRIGERATION MAN?**

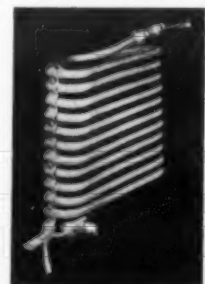
We train men for positions in the Refrigeration and Air Conditioning Industry. We realize that in this work we owe a duty to the industry as a whole as well as to our students. We know that if we are to benefit our students, they must be trained the way you want them to be trained.

Therefore, leading manufacturers have cooperated in preparation of the U. E. I. Courses in Electric Refrigeration and Air Conditioning. When you hire a U. E. I. man, you may be assured he "knows his stuff". He is practically, thoroughly and authoritatively trained and capable of rendering efficient service to you.

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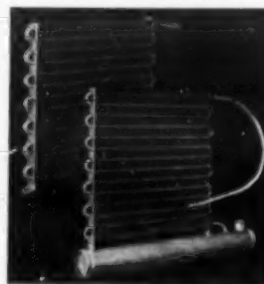
LET US SERVE YOU

**KRAMER**

air and water cooled

CONDENSERS

Built to the standard of quality evident in Kramer Refrigeration Products. Detailed description Pages 40 and 41 in Catalog No. 336. Do you have a copy?

**TRENTON AUTO RADIATOR WORKS**

210 West 65th, N.Y.C. TRENTON, N.J. 5114 Liberty Ave., Pittsburgh, Pa.

Results of Goodman's Tests on Air Stream Temperatures Differ From Previous Research Data

SKYTOP, Pa.—Presenting a discussion of a new method for determining the dry and wet bulb temperatures of an air stream at any point in its passage over a cooling surface, William Goodman of the Trane Co., LaCrosse, Wis., presented results of experiments which diverged sharply from findings of other authorities on the subject, with the result that his paper brought forth liveliest of the discussions in the technical program at the A.S.R.E. meeting here last week.

"Ever since surface coolers and dehumidifiers have come into widespread use for air conditioning, the question of computing their performance characteristics has been very much to the front," Mr. Goodman began.

Determination of Final Temperatures

"Among the most important of these performance characteristics is the determination of the final dry and wet bulb temperatures of the air leaving the dehumidifying surface.

"Closely allied with the question of determining the final wet bulb temperature of the air leaving a coil is that of determining its total heat capacity; that is, the quantities of sensible and latent heat which the coil can remove from an air-vapor mixture flowing through it. Hitherto, only approximate methods have been available for computing these performance characteristics."

Use of 'Straight-Line' Law

On the assumption that the surface temperature is constant, much use has been made of the "straight-line" law to determine the condition of the air leaving a cooling coil, said Mr. Goodman.

"The use of the 'straight-line' law in this way yields approximate results, because the temperature of the surface of a convection cooling coil—that is, one with a forced flow of air—is not constant," declared the speaker.

"There is a sufficient variation in surface temperature to make the assumption of constant surface temperature untenable, even for ordinary engineering work.

"However, the 'straight-line' law in itself is fundamentally sound and when correctly applied yields results which are in accord with experimental evidence. A method of applying this important law to the problem of computing the performance of cooling coils will be presented.

First Rational Step

"The 'straight-line' law published by Lewis was the first rational step toward a real understanding of the dehumidifying and cooling process. Utilizing the remarkable Lewis relationship between the coefficient of sensible heat transfer and the coefficient of vapor diffusion through an air film, both Lewis and Markel independently derived what has since come to be generally known as the 'straight-line' law.

"According to this law the point representing the condition of an air stream at any point in its travel over a wetted cooling surface must lie on the straight line (drawn on a Carrier type psychrometric chart) joining the point on the saturation curve representing the initial condition of the air, with the point on the saturation curve representing the constant surface temperature.

Only Valid if Constant Temperature

"However, Lewis clearly stated that this law was valid only for a cooling surface whose temperature was constant throughout, since his mathematical proof of this law was based on the assumption that the temperature of the surface was constant. Furthermore, in his experiments, an effort was made to fulfill this condition of constant surface temperature.

"In any cooling surface in which the transfer of heat to the surface takes place by convection, the temperature of that surface will fall as the air progressively passes over it.

"This fact makes it possible to use the 'straight-line' law in its elementary form to represent accurately the condition of the air flowing past such a surface. It is the purpose of this paper to extend the application of this law to cooling and dehumidification coils in which the surface temperature varies, the air passing over colder and colder surfaces as it successively flows through the various rows of tubes."

Curve Results in Tests

To prove the foregoing statement, stated Mr. Goodman, it is necessary only to erect a series of one row of coils and measure the dry and wet bulb temperatures of the air leaving each row of coils.

"If the surface temperature is constant, the points on the psychrometric

chart, representing the condition of the air between each row of coils, must fall on a straight line. Instead of a straight line it was found that a curve always results from such a test.

"Furthermore it was shown later that a straight line can never represent the condition of the air at each point in its passage over a wetted surface unless the refrigerant film coefficient is infinite, a condition which can never be even remotely approached in actual practice."

Knaus and Pownall Theory

Both Knaus and Pownall, other authorities who studied the problem, determined the validity of using the "straight-line," not by dry and wet bulb temperature readings between several coils, but only by temperature readings at the inlet and outlet of one multirow coil, said Mr. Goodman. These temperature readings were then used to compute the ratio of the total to the sensible heat removed by the coil.

"Now if the 'straight-line' law is applicable it can be shown mathematically that it should be possible to compute this same ratio from the initial condition of the air and the condition of saturated air having a temperature equal to the constant surface temperature.

"Both Knaus and Pownall used this method of establishing the validity of the 'straight-line' law. But the whole question hinges upon the method used to determine the surface temperatures. If the average surface temperatures were calculated on the assumption that they were constant, it is hardly surprising that the total-sensible heat ratios, computed by the two methods previously mentioned, should be in agreement."

Defines Surface Temperatures

Mr. Goodman set forth his definition of surface temperatures as follows:

In a cross-section through a cold metal wall, a portion of the wall is dry while the remainder is covered with a thin film of moisture which has condensed from the air stream flowing past the metal wall.

Referring to the dry portion, the outside surface temperature is usually defined as the temperature of the outer skin of metal—that is, the actual temperature of the metal surface which is in contact with the air film adhering to the surface.

Similarly, the inside surface temperature is defined as the temperature of the inner surface of the metal which is in actual contact with the refrigerant film.

Temperatures Different

Since the metal wall offers a definite resistance to the flow of heat, the surface temperatures on the two sides of the wall differ from each other.

However, the resistance of the metal wall is so very small compared to the rather large resistance of the air and refrigerant films that its effect on the total heat flow is negligible.

For this reason it is quite customary to neglect the resistance of the metal in heat flow computations. Inasmuch as the resistance of the metal wall is negligibly small, it is apparent that the temperatures on both sides of the wall will differ by such a small amount that they may be considered a substantially equal to each other.

So far as the wetted portion of the metal wall is concerned, the inside surface temperature is defined in exactly the same way as for the dry portion.

Liquid Temperature Used

However, by the "outside surface temperature" is meant, not the temperature of the outer skin of the metal, but the temperature of the outer face of the thin film of liquid covering the cold metal wall.

By the outer face of the liquid is meant the surface of the liquid in contact with the air. The temperature of the inner surface of the metal wall may be considered as substantially equal to the surface temperature of the liquid film, because the total resistance of the thin film of liquid and the metal wall is so low compared to the resistance of the air and refrigeration films.

"The fact that the inner and outer surface temperatures of a coil are substantially equal to each other at any one point should not be confused with the fact that the surface temperature of a coil does vary from point to point as the air flows past it," Mr. Goodman explained.

"When a coil is completely covered with moisture condensed from the air, the surface temperature at any one point on the coil depends only upon the wet bulb temperature of the air flowing past that point, as long as the refrigerant temperature at that

point, and the air velocity are constant.

Effect of Heat Content

"Since air loses heat as it flows through the coil, it is apparent that its total heat content continually drops. As a result the surface temperature of the coil must be falling from the point where the air enters, to the point where it leaves the coil.

"Interpreted practically, this means that the last row of tubes with which the air is in contact, is colder than the preceding row, and that this row is in turn colder than the row ahead of it—in spite of the fact that the refrigerant temperature may be the same in every row of tubes."

If the refrigerant temperature is constant, said Mr. Goodman, the surface temperature will be constant and equal to the refrigerant temperature.

"It is apparent that the 'straight-line' law is applicable only to a coil with a refrigerant of constant temperature whose film conductivity is infinite. Needless to say, such a condition is not even remotely approached in actual practice."

Condition Curve

Mr. Goodman explained that the condition curve is the curve on a psychrometric chart which gives the relation between the dry and wet bulb temperatures of an air stream—in other words, the condition of the air at any point in its passage over a cold, wetted surface.

"It should be clearly understood," he stated, "that the condition curve does not give the wet bulb temperature of the air at any particular point on the surface. The wet bulb temperature of the air flowing over any particular point of the surface must be determined by an independent method which will be presented later.

"However, once the wet bulb temperature of the air at any point on the coil has been found, its dry bulb temperature can be determined from

Scientific Golfers



Left to right are Dan Wile of Detroit Lubricator Co., R. J. Thompson of Kinetic Chemicals, and William Higham of Universal Cooler Corp., three widely-known names in the refrigeration engineering field, are pictured here expressing avid interest in the efforts of the remaining member of their foursome to get the ball off one of the tees at the Skytop Club, where the midyear A.S.R.E. meeting was held last week.

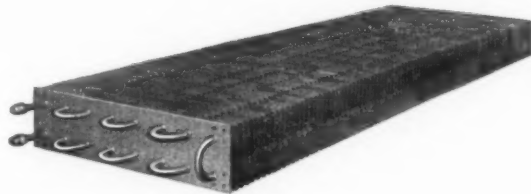
the condition curve.

"Having the condition curve representing the relationship between the dry and wet bulb temperature of an air stream at any point in its travel through a coil, it is evident that if either the dry or wet bulb temperature of the air is known at that point,

the remaining temperature may be found."

Mr. Goodman's complete paper gives a formula for determining the wet bulb temperature of an air stream, at any point in its passage over a wetted surface which is cooled by a refrigerant at constant temperature.

BUSH COMMERCIAL COILS



FOR WALK-IN COOLERS

OVERHEAD OR SIDE BUNKER
LOW OR HIGH CEILING



FOR REACH-IN COOLERS

SIDE OR TOP ICERS



FOR SHOW CASES

TOP DISPLAY
FULL VISION
DOUBLE DUTY
BACK BUNKER
END BUNKER

SEND FOR OUR NEW CATALOGUE

IT LISTS COILS BY AREA, SIZE AND PRICE. THE AREA SHOWN IN OUR CATALOGUE IS ACTUAL EXPOSED SURFACE. THE TUBES IN BUSH COILS HAVE NO INTERNAL RESTRICTIONS TO CAUSE EXCESSIVE PRESSURE DROP.

COILS FOR COOLING, HEATING, AIR CONDITIONING — CONDENSERS — FINNED TUBING

THE BUSH MFG. CO.

OFFICE AND FACTORY
100 WELLINGTON ST., HARTFORD, CONN.

BRANCH FACTORY
610 N. OAKLEY BLVD., CHICAGO

PHILADELPHIA
2402 MARKET ST.

OFFICES AT
NEW YORK
489 FIFTH AVE.

DETROIT
6432 CASS AVE.

WARD

Montgomery Ward, Chicago, Ill.

Model No.	S400	S550	E6610	P6625	6620	6820	6120
Compressor Model No.	10750	10750	10750	10750	10225	10225	10225
PRICE							
Retail price, installed.....	\$94.95	\$104.95	\$114.95	\$134.95	\$154.95	\$169.95	\$254.95
Cabinet finish, exterior.....	Dulux			Porc.	Dulux		
CABINET DIMENSIONS							
Overall height (inches).....	50 1/4	53 1/4	55 1/4	55 1/4	58	62	62
Overall width (inches).....	23 1/2	27 1/2	30	30	30	33	42 1/2
Overall depth (inches).....	20 1/2	23 1/2	25	25	23 1/4	23 1/4	22 3/4
Inside height (inches).....	26 1/4	28 1/4					
Inside width (inches).....	18 1/2	20 1/2					
Inside depth (inches).....	15 1/2	17 1/2					
Number of doors.....	1	1	1	1	1	1	2
STORAGE CAPACITY							
Net food storage (cu. ft.).....	4.0	5.65	6.33	6.33	6.73	8.8	12
Number of shelves.....	3	4	4	4	5	6	..
Total shelf area (sq. ft.).....	7.5	11.0	13.0	13.0	14	19	26
Cabinet finish (interior).....	Porcelain						
INSULATION							
Top (thickness in inches).....	2	2 1/2	3	3	3	3	3
Sides.....	2	2 1/2	3	3	3	3	3
Back.....	2	2 1/2	3	3	3	3	2
Door.....	2 1/2	2 1/2	3	3	3	3	3
Bottom.....	2	2	3	3	3	3	3
ICE CUBES							
Number of shallow trays.....	3	3	2	2	3	5	6
Number of cocktail trays.....	0	0	2	2	2	2	0
Total number of cubes.....	54	63	84	84	90	128	144
Total weight of cubes (lbs.).....	4	5	6	6	8	13	16
COMPRESSOR							
Ice melting effect 24 hrs. (lbs.).....	1/6	1/6	1/6	1/6	1/5	1/5	1/3
Motor horsepower.....	16	16	20	20	20	28	28
Quantity of lubricant (oz.).....	11	11	11	11	8	10	10
Refrigerant in system (oz.).....							
Belt circumference (inches).....							
Belt width (64ths of an inch).....	44						
WEIGHT							
Net weight (lbs.).....	270	300	375	410	425	475	520
Shipping weight (lbs.).....							

COMPRESSOR

Made by ———, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. 10750—single cylinder, 387 r.p.m. in Models S400 and S550; 410 r.p.m. in E6610 and P6625; 1 1/2-in. bore, 1 1/4-in. stroke.

Compressor Model No. 10225—twin cylinder, 500 r.p.m. in Models 6620 and 6820; 540 in Model 6120; 1 1/2-in. bore, 1 7/16-in. stroke.

Refrigerant, methyl chloride in 10750; sulphur dioxide in 10225. Lubricant, Sun Oil Co.

Shaft seal, bellows.

CABINET

Made by Seeger (S-400, S-550, 6620, 6820, 6120), Leonard (E6610, P6625).

Models S-400, S-550, E6610, P6625—wood frame with Hermetex insulation and Panelyte breaker strip.

Models 6620, 6820, 6120—steel frame with Balsam Wool insulation, and Insurock breaker strip.

Balloon rubber gasket.

HARDWARE

Made by ———. Brass with bright chrome finish.

MOTOR

Condenser-start type made by Delco. Oil semi-annually.

CONDENSER

Made by ———; fan cooled; square fin condenser (S-400, S550), continuous tube wrinkle fin condenser, (E6610, P6625), steel—copper brazed condenser (6620, 6820, 6120).

EVAPORATOR

Made by ———, wrapped copper coil (S-400, S-550), wrapped copper coil with humidifying baffle (E6610, P6625), fabricated brass, (6620, 6820, 6120).

Detroit Lubricator expansion valve refrigerant control (S-400, S-550, E6610, P6625), high-side refrigerant control, (6620, 6820, 6120).

Anodic aluminum and rubber ice trays. Rubber grid and cocktail trays (E6610, P6625), tray release (6620, 6820, 6120).

CONTROL

Tagliabue (S-400, S-550), Ranco (E6610, P6625), ——— (6620, 6820, 6120), adjustable temperature.

Tagliabue model R18; Ranco model KRL477; ——— Model 1124143 (YJ), mounted inside cabinet.

Wide-cycle defrosting on S-400, S-550, E6610, P6625 and semi-automatic defrosting on 6620, 6820, 6120.

Vacation cycle on E6610, P6625, 6620, 6820, 6120.

Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: Five-year protection plan.

Serviced by: Factory-trained service men.

Replacement parts are not sold to independent service companies.

O'KEEFE & MERRITT

O'Keefe & Merritt Co., Los Angeles, Calif.

Model No.	636	736	1036
Compressor Model No.			
PRICE			
Retail price, installed.....	\$194.50	\$219.50	\$319.50
Cabinet finish, exterior.....	Dulux		
CABINET DIMENSIONS			
Overall height (inches).....	59 1/4	62 1/4	62 1/4
Overall width (inches).....	29	31	43
Overall depth (inches).....	22 1/2	22 1/2	22 1/2
Inside height (inches).....	30	33	33
Inside width (inches).....	22	24	36
Inside depth (inches).....	17	17	17
Number of doors.....	1	1	2
STORAGE CAPACITY			
Net food storage (cu. ft.).....	6.22	7.42	10.45
Number of shelves.....	4	4	4
Total shelf area (sq. ft.).....	11.2	12.2	20.0
Cabinet finish (interior).....	Porcelain		
INSULATION			
Top (thickness in inches).....	3 1/2	3 1/2	3 1/2
Sides.....	3 1/2	3 1/2	3 1/2
Back.....	3	3	3
Door.....	3	3	3
Bottom.....	3	3	3
ICE CUBES			
Number of shallow trays.....	3	4	6
Number of deep trays.....	0	0	0
Total number of cubes.....	84	112	168
Total weight of cubes (lbs.).....	5 1/4	7	10 1/2
COMPRESSOR			
Ice melting effect 24 hrs. (lbs.).....	103	135	161
Motor horsepower.....	1/6	1/6	1/6
Refrigerant in system (lbs.).....	3	3 1/2	3 3/4
Quantity of lubricant (oz.).....	18	18	18
Belt circumference (inches).....	34		
Belt width (64ths of an inch).....	32		
WEIGHT			
Net weight (lbs.).....	425	450	575
Shipping weight (lbs.).....			

COMPRESSOR

Made by O'Keefe & Merritt, open, reciprocating, belt-driven compressor located below food compartment.

Compressor Model No. 636—twin cylinder, 450 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Compressor Model No. 736—twin cylinder, 450 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Compressor Model No. 1036—twin cylinder, 450 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Refrigerant, Sulphur dioxide. Lubricant, Sunisco.

Shaft seal, rotary.

CABINET

Made by O'Keefe & Merritt. Wood frame with Celotex insulation, Panelyte breaker strip, rubber gasket.

HARDWARE

Made by National Lock Co. Chrome-plated brass.

MOTOR

Capacitor type made by Wagner. Oil every three months.

CONDENSER

Flexco, fan cooled, fin condenser.

EVAPORATOR

O'Keefe & Merritt, steel shell. Detroit Lubricator thermal expansion valve refrigerant control.

Aluminum ice trays. Tray release, rubber tray.

CONTROL

Ranco adjustable temperature control, Model KR439, mounted inside the cabinet. Semi-automatic defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One-year guarantee; five-year protection plan for \$5.00 additional.

Guarantee on system: One-year guarantee; five-year protection plan for \$5.00 additional.

Serviced by: O'Keefe & Merritt Co.

Replacement parts sold to independent service companies.

SPECIAL FEATURES

Thermometer, interior light, vegetable freshener, dairy basket, arranging shelf, rubber shelf supports, double-activity door latch, unit compartment insulated.

Electrified Farm to Be on Display for Power Conference

WASHINGTON, D. C.—Replete with every device from an electric hay hoist to ultra violet lamps for chickens, a completely electrified farm will be opened July 1, at Leesburg Pike, near Herndon, Va., as the first exhibit of the Third World Power Conference, which will be held here Sept. 7-12.

Rosedale Dairy Farm, selected for the exhibit, has been equipped through the cooperation of the Rural Electrification Administration, National Electrical Manufacturers Association, and other private firms. Power will be furnished by Virginia Public Service.

The rambling old farm house, which is over 200 years old, and still has some of the original logs in its walls, will be completely air conditioned. It will contain an electric refrigerator, range, water heater, dishwasher, ironer, washing machine, vacuum cleaners, sun ray lamps, electric churn, oscillating fan, clocks, radio, toaster, waffle iron, percolator, mixer, and other appliances.

Milk Cooler in Barn

Farm chores such as wood chopping, feed grinding, milking, will be done by electricity, as well incubating and repair shop work.

Besides an electric milking machine, the dairy barn will contain a milk cooler in which milk will be immediately cooled to ice box temperatures. It will also have ventilating fans, hot water, and other conveniences.

Ultra violet rays, which are claimed to have a healthy effect on chickens, will be dispensed from special lamps in the poultry house.

Flood lights will illuminate the farm yard for chores done after dark. A portable electric motor, which can be trundled to any part of the farm and used for sausage grinding, churning, carpenter work, and other chores, will be supplied.

Other features representing the ultimate in electrical farm equipment include an electrically heated hotbed, wherein vegetables can be planted early in the season without danger of their being frost-bitten; electrically charged screens, which will electrocute insects; and a single wire fence with a light electric charge to keep livestock within bounds.

Electric Irrigation System

An electric irrigation system is also being installed, and all water pumping on the farm's old well will be done electrically.

The farm, owned and operated by J. M. Hughes and his sons, Darr and Randolph, will be open to the public during the summer. Trips to the farm will be arranged for the 700 distinguished scientists and engineers expected to attend the Conference.

More than 40 nations will be represented at the Washington Conference, which is sponsored and financed jointly by the United States Government and the electrical industry, with American engineering and trade associations cooperating. Discussion will center on "The National Power Economy," at the meeting.

A series of technical study tours will round out the conference program, with visits to water power projects, steam power plants, research laboratories, coal mines, oil wells, the Tennessee Valley, Niagara Falls, Pittsburgh, Schenectady, Detroit, Chicago, New York, and the Pacific Coast.

Cleveland Dealers Hear Business Bureau Speaker

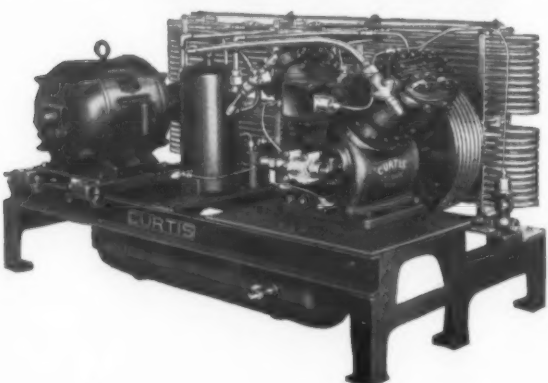
CLEVELAND — "Bait and Fraudulent Advertising" was the subject of talk by William M. Farrar, of the Cleveland Better Business Bureau, at the Cleveland Retail Appliance Dealers' Association's second open meeting of the year June 10.

Ralph H. Jones, secretary of the Cleveland Electrical League, spoke on "Benefits of Organization."

Distributor Gets Publicity With Carload Order

DAVENPORT, Iowa—Charles G. Witt, president of Witt Hardware Co., used his carload order of Crosley refrigerators for a promotion stunt by unloading them from the bannered freight car on new Ford trucks furnished by Ford dealers and parading them through the tri-cities of Rock Island, Moline, and Davenport.

Local newspapers gave the event generous publicity, Mr. Witt reports.

ONLY CURTIS CAN GIVE YOU

- The Most Complete Line (86 sizes)
- Timken Tapered Roller Bearings (long life)
- "V" Type Radical Design (short sturdy crankshaft)
- Patented "Centro-Ring" Oiling (Positive Pressure Type)
- Water Cooled Cylinders and Cylinder Head (Highest Efficiency)

These features insure highest efficiency, low operating cost and long life.

There is a correct CURTIS Unit for every Commercial, Industrial or Air-Conditioning installation.

Sizes 1/6 H. P. to 30 Tons

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Company
1912 Kienlen Avenue, Saint Louis, U. S. A.

In Canada

CANADIAN CURTIS REFRIGERATION CO., LTD.
20 George Street, Hamilton, Ontario, Canada

**EVAP CONDENSER ASSURES BIG MONEY!**

New Profit Item, with Ready Market
Compact—Complete—Easy to Install
FOR USE WITH ALL MECHANICAL REFRIGERATION UNITS

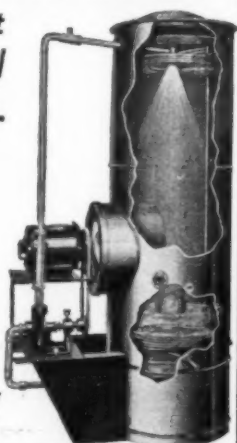
A combined water tower and highly efficient condenser.

LOW ORIGINAL COST...
ECONOMICAL IN OPERATION

Completely pays for itself in a short period by savings in water and power consumption.

DEALERS NOTICE—Write for complete information and dealer's set-up.

THE BRUS COMPANY
215 EAST 20th ST. KANSAS CITY, MO.



Air Conditioning

New Refrigerating Unit Adopted for G-E Conditioners

BLOOMFIELD, N. J.—A new air-conditioning refrigeration machine, embodying many of the principles of design used in some of the finest modern automobile and airplane engines, has been introduced by the air-conditioning department of General Electric Co.

The new unit features a V-type compressor of eight cylinders, and utilizes a large capacity shell and tube type condenser, said to effect high economy in water and electric power. Compressor, motor, and condenser are mounted in one compact unit, and the unit has a refrigeration capacity equivalent to the melting of 40 tons of ice in 24 hours.

By using two or more of these condensing units on large installations in theaters, stores, or hotels, it is said to be possible to obtain a greater degree of flexibility and control than that possible with one large unit. Other advantages claimed for multiple systems of this type are low operating cost and longer life of equipment.

Danforth Uses Direct Mail Campaign on Air Conditioners

PITTSBURGH — A special direct-mail campaign comprised of three series of three separate mailing pieces each, has taken the buy-Westinghouse-air-conditioning-equipment message of the I. W. Danforth Co., distributor here, to 2,000 persons in this city, and has secured many new sales and a host of live leads, according to I. W. Danforth, president.

Sent to a selected list of prospects, the mailing pieces were highly personalized; each unit of the series dealt with the prospect's specific air-conditioning requirements. Sales calls followed the letters.

Designed for three types of prospects, campaign pieces were sent to a list of 750 business executives, 690 homeowner prospects, and to a "miscellaneous" group, including stores, beauty shops, and morticians.

H. W. Reding, manager of Danforth's air-conditioning department, planned and put on the campaign, said to be the most extensive ever carried on by a Westinghouse air-conditioning distributor.

Westinghouse Reverse Cycle System Used By Power Co.

RIVERSIDE, Calif.—Claimed to be the only installation of its type in commercial use today, an all-electric year-round air-conditioning and heating system has been installed in the administration building of Southern Sierras Power Co. here by Gay Engineering Co. of Los Angeles.

Westinghouse air-conditioning compressors and control equipment is used in the system, which supplies heated or cooled air, regulates the humidity, and filters and circulates the air. Automatically operated, the system is turned on in the morning and off at night by a time clock.

Using the "reverse cycle" of refrigeration, the system has a heating capacity equal to burning 2,500 lbs. of coal per day. It has a 75-ton refrigerating capacity. Since the equipment was installed, it is claimed, temperatures inside the building have been held within 1° F. and operating cost has been lower than the amount spent previously on heating alone.

York Gets 3 Contracts of Total Value of \$350,000

YORK, Pa.—Three air-conditioning contracts involving a total expenditure of \$350,000 were recently received by York Ice Machinery Corp. here, reports J. R. Hertzler, manager of York's air-conditioning department.

Installations are for Gimbel's department store, Pittsburgh, the Mayflower Hotel, Washington, D. C., and Lowenstein's department store, Memphis, a unit of the City Stores Co.

Avon Corp. Moves to Larger Quarters in Philadelphia

PHILADELPHIA—Avon Corp., distributor of Corozone air-conditioning equipment, recently moved its offices, showrooms, and warehouse to 122 S. 22nd St.

13 Installations Made In Omaha in 36; Total Is 113

OMAHA—Thirteen air conditioning installations have been made in Omaha so far this year—bringing the total number of installations here to 113. This number includes 25 residences, 13 restaurants and bars, and six theaters.

Three contractors had complete air-conditioning exhibits at the recent Builders Show held here. Gilbert Olson, one of the first in Omaha to enter the air-conditioning business, spoke on its comfort cooling conveniences at the evening programs given during the show. It was estimated that approximately 20,000 people heard Mr. Olson's talks.

The Buck Booterie, one of the city's largest shoe stores, is using a window display in which a giant red arrow, adjusted to point to the 70° mark on a thermometer, centers attention on its air-cooled interior. When the inside temperature of the window is greater than 70°, the arrow is arranged accordingly.

A course on air conditioning was recently added to the Municipal university curriculum. Its subject covers residential installations rather than those designed for factory or business offices.

Natkin Gets Bank and Dept. Store Jobs

KANSAS CITY—Two large air-conditioning installations—in the First National Bank Building, Lincoln, Neb., and in the New Utica department store, Des Moines—are present projects of Natkin & Co., distributor of Westinghouse air-conditioning equipment in this territory.

Involving the expenditure of approximately \$50,000, the bank installation will provide year-round air conditioning for both the main bank and trust company quarters, and for 210 offices on the building's upper floors. To install the duct system through which the conditioned air will be distributed, hall ceilings are being lowered 18 to 20 inches.

To cool the basement and street level floors in the New Utica department store, a 44-ton refrigeration system is being installed. Total floor space to be cooled is 16,000-sq. ft. The system will provide for the introduction of 350,000-cu. ft. of fresh air to the building each hour.

Department store officials plan to have the second, third, and fourth floors of the building air conditioned at a later date.

300 Air-Conditioned Buses Bought by Greyhound

DETROIT—A new streamlined, air-conditioned bus, the first of 300 being built by General Motors Truck Corp. for the Greyhound Lines, was put into service Saturday morning, June 27, on the Detroit-Cincinnati run. Cost of the 300 buses to Greyhound, it is estimated, will be \$5,000,000.

An innovation in bus transportation, the new vehicle's interior is designed to be both sound- and vibration-proof. The motor is in the rear, permitting a low center of gravity and removing engine heat and fumes from passengers.

The bus is 32 feet long, 8 feet wide, and has accommodations for 36 passengers. Interior appointments were designed by Raymond Loewy, French artist, who styled this year's Coldspot electric refrigerators for Sears, Roebuck Co. Built of duralumin, the bus is said to have passenger-car performance on the highway.

40 Finish Utility's Course In Air Conditioning

NEWARK—Forty men from various offices and departments of the Public Service Corp. of New Jersey recently completed a four month air-conditioning course given by the utility. Classes were held in the Terminal building here twice a week since the first of March.

Divided into two classes, the course on air-conditioning theory and application was conducted by H. Preston Morehouse and Kenneth I. Robinson, of the Public Service Co.'s air-conditioning department.

Inspection of equipment in the Terminal building, which supplies conditioned air to the Newark commercial office sales floor, was a feature of the course, as were discussions of practical problems brought up by the students.

Parts Manufacturers Well Represented at Skytop Conference



Left: C. T. Bappler of Bush Mfg. Co. gets set to drive the pellet a mile down the fairway. Center: Irving J. Knudson of Detroit Lubricator Co. evidently relishes his portion of food served at the ASRE-ASHVE steak fry. Right: Charles Haven of Thermopane Co. and Carl Conkey of Larkin Refrigerating Corp. at Skytop Lodge.

Westinghouse Gets 60-Ton Toledo Dept. Store Job

TOLEDO—Contract for a 60-ton air-conditioning system to cool the eighth-floor restaurant and auditorium in the La Salle & Koch department store here was obtained recently by Hoffman & Harpst Co., distributor of Westinghouse air-conditioning equipment here.

Four Westinghouse units comprise the cooling system, which is to be placed on the eleventh floor with other conditioning equipment. Heat from the system will be removed through a spray pond on the thirteenth floor penthouse roof.

Contract for this installation, and for the equipment now being installed in the Bell building here, secures for Hoffman & Harpst two of the most important air-conditioning installations to be made this year in Toledo.

Byrne & Gannon Named Friez Representatives

BALTIMORE—W. L. Byrne, 4 Smithfield St., Pittsburgh, and Russell R. Gannon Co., 519 Main St., Cincinnati, were recently appointed factory representatives for the air-conditioning instruments and controls department of Julien P. Friez & Sons, Inc., of this city.

Build BETTER PERFORMANCE into 1937 models



No. 672

The surest way to provide better and more dependable performance of direct expansion systems for domestic refrigeration, is the use of "Genuine Detroit" Valves.

The No. 672 Automatic Expansion Valve has a ten year record for satisfactory domestic service. It is built to last—heavy construction and corrosion resistant materials. It is easy to install, easy to adjust and easy to clean—and it holds its adjustment.

The No. 676 Automatic Expansion Valve is similar to the No. 672 except that it is actuated by a diaphragm instead of a bellows. The same durability, ease of installation, adjustment and cleaning is characteristic of both valves.

Write for detailed information on these units



No. 676



DETROIT LUBRICATOR COMPANY
 Detroit, Mich. U. S. A., 5900 Trumbull Ave.
 New York, N. Y.—40 West 40th St. • Chicago, Ill.—86
 5 Michigan Ave. • Los Angeles, Calif.—225 Crocker Blvd.
 DIVISION OF AMERICAN RADIAL RUBBER &
 STANDARD SANITARY CORPORATION
 Canadian Representative—Railway and
 Engineering Supplies Limited,
 Montreal, Toronto,
 Winnipeg

Easy Summer Meals Are Discussed in Range Article

NEW YORK CITY—Norma Newton, director of the home service department of the Los Angeles Bureau of Power & Light, as guest editor for the July issue of *McCall's Magazine*, tells how to prepare "easy summer meals" in an article featuring the electric range.

Stress placed by the home economist on meals that can be cooked in a cool kitchen is expected to help electric range sales this summer.

A special research study on oven cookery was carried on for six months at Iowa State College under the direction of Dr. Louise Peet, head of the department of household equipment, and Miss Belle Lowe, associate professor of foods and nutrition. Mrs. Newton added her practical experience to this research in copy preparation. With menus for demonstration of her point, Mrs. Newton offers two basic rules for oven meal combinations: choose foods that cook in about the same length of time, and at about the same temperature.

A few other rules for the use of the range were offered, such as: arrange the utensils so that there is at least an inch of space around each one to allow for the proper circulation of heat. "Choose the right combination of foods, the correct pans, set your time and temperature controls properly, and oven meals are easy," according to this home expert.

When cooking vegetables in the oven, Mrs. Newton says that just enough water to cover the bottom of the utensil is used. Pans with tight lids are necessary to prevent the escape of steam, for if too much steam escapes all the water will evaporate and the vegetables will be dry.

Steam from vegetables and casserole dishes also impairs the quality of delicate foods such as cakes.

Mrs. Newton's article on electric ranges is one of several that have been written by home service directors for *McCall's*. Other guest editors from the appliance industry who have previously contributed to the magazine are: Fern Snider, Valentine Thorson, Laura Rischman, Jean Lovejoy, Vera Elwood, Ruth Menoher, Eloise Davison, and Ada Bessie Swann.

Colored Hardware Sets Offered Purchasers Of Kelvinators

DETROIT—Brightly colored refrigeration hardware sets each consisting of an enamel door handle and harmonizing cap for door hinge peaks, colored to accent individual kitchen decorative schemes, are now being offered by Kelvinator dealers.

The new sets are designed to harmonize with the Kelvinator Kitchen utensils, among which are pots, electric clocks, and tea kettles, colored in black, yellow, tomato red, lettuce green, medium blue, and white, which according to Eva McPherson, director of Kelvin Kitchen, have had a wide popularity with housewives who have bought Kelvinator appliances and utensils.

42 Westinghouse Units Installed at Mooseheart

MOOSEHEART, Ill.—To preserve the food for the 1,500 children living in "Child City," home for orphans and widows of deceased members of the Moose organization here, 42 DLX-95 Westinghouse electric refrigerators were recently installed.

Officials of the Moose later placed an order for 10 additional boxes to be installed in Moosehaven, a similar home at Orange Park, Fla.

The Child City Westinghouse installation is being publicized in *The Moose Magazine*, a publication which is circulated to 500,000 families throughout the United States.

THE MASTERCRAFT ADJUSTABLE PAD AND CARRYING HARNESS FOR SAFE DELIVERY OF AUTOMATIC REFRIGERATORS

Pad and harness adjustable to many sizes and styles of cabinets. Economical—Efficient. Sturdily constructed, easily applied. Name of refrigerator attractively lettered on pad without charge.



BEARE MANUFACTURING CO.
3615-3825 Cortland Street, Chicago, Illinois

MAYFLOWER

Mayflower, Inc., Lima, Ohio.

Model No.	G46	G56	G66	G86	GP66	GP86
Compressor Model No.	T-70	TL-70	TL-70	TL-140	TL-70	TL-140

PRICE

Retail price, installed	Sold on factory net price basis only					
Cabinet finish, exterior	Dulux					
	Porcelain					

CABINET DIMENSIONS

Overall height (inches)	52½	56½	58½	63	58½	63
Overall width (inches)	24½	26½	29	31½	29	31½
Overall depth (inches)	21½	21½	21½	22½	21½	22½
Inside height (inches)	26	29½	31½	35½	31½	35½
Inside width (inches)	19	21	23½	25½	23½	25½
Inside depth (inches)	16	16	16	16	16	16
Number of doors	1					

STORAGE CAPACITY

Net food storage (cu. ft.)	4.3	5.5	6.4	8.0	6.4	8.0
Number of shelves	4	4	4	4	4	4
Total shelf area (sq. ft.)	9.7	12.1	13.4	14.75	13.4	14.75
Cabinet finish (interior)	Porcelain					

INSULATION

Top (thickness in inches)	2½	2½	2½	3	2½	3
Sides	2½	2½	2½	3	2½	3
Back	2½	2½	2½	3	2½	3
Door	2½	2½	2½	3½	2½	3½
Bottom	2½	2½	3	3½	3	3½

ICE CUBES

Number of shallow trays	2	2	3	4	3	4
Number of deep trays	0	0	0	0	0	0
Total number of cubes	56	56	84	112	84	112
Total weight of cubes (lbs.)	4½	4½	7½	9½	7½	9½

COMPRESSOR

Ice melting effect 24 hrs.	110	110	110	158	110	158
Motor horsepower	1/6	1/6	1/6	1/4	1/6	1/4
Refrigerant in system (lbs.)	4, 4½, and 5					
Quantity of lubricant (oz.)	18	18	18	18	18	18
Belt circumference (inches)	32½					
Belt width (64ths of inch)	32					

WEIGHT

Net weight (lbs.)	265	285	355	375	360	380
Shipping weight (lbs.)						

COMPRESSOR

Made by Tecumseh, open, reciprocating, belt-driven compressor located below food compartment.

Compressor No. TL-70—single cylinder, 530 r.p.m., 1 7/16-in. bore, 1 7/16-in. stroke.

Compressor No. TL-140—twin cylinder, 450 r.p.m., 1 7/16-in. bore, 1 7/16-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, Suniso No. 2. Shaft seal, bellows.

CABINET

Made by Midwest Stamping & Enameling Co. Steel frame with Balsam Wool insulation, Tylac breaker strip, Miller rubber gasket.

HARDWARE

Made by Grand Rapids Brass. Chromium finish.

MOTOR

Capacitor-start induction-run type made by Leland. Oil annually.

CONDENSER

McCord, fan cooled, integral fin, single and double pass type condenser.

EVAPORATOR

Made by Mullins, porcelain on steel shell type. Low side float refrigerant control. Aluminum ice trays. One rubber tray in all models except G-46.

CONTROL

Ranco adjustable temperature control type KRSV, mounted inside the cabinet. Wide-cycle defrosting. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year standard warranty.
Guarantee on system: One year standard warranty.

Serviced by: Distributors and dealers.

SPECIAL FEATURES

Replacement parts are sold to independent service companies.

TRUPAR

Trupar Mfg. Co., Detroit, Mich.

Model No.	M-436	M-736	M-936
Compressor Model No.	C2-16	C2-16	C2-20

PRICE

Retail price, installed	\$119.50	\$199.50	\$249.50
Cabinet finish, exterior	Lacquer		

CABINET DIMENSIONS

Overall height (inches)	54½	58	61½
Overall width (inches)	23½	30½	32½
Overall depth (inches)	23	26½	26½
Inside height (inches)	26½	30	33½
Inside width (inches)	19½	23½	26½
Inside depth (inches)	16½	19½	18½
Number of doors	1		

STORAGE CAPACITY

Net food storage (cu. ft.)	4.5	7.10	9.01
Number of shelves	3	4	5
Total shelf area (sq. ft.)	8.5	14.0	17.4
Cabinet finish (interior)	Porcelain		

INSULATION

Top (thickness in inches)	2	3	3
Sides	2	3	3
Back	2	3	3
Door	2½	3	3
Bottom	2	3½	3½

ICE CUBES

Number of shallow trays	3	2	2
Number of deep trays	0	1	2
Total number of cubes	63	98	126
Total weight of cubes (lbs.)	6	9	11

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	115	115	138
Motor horsepower	1/6	1/6	1/5
Refrigerant in system (lb.)	1	1	1
Quantity of lubricant (pt.)	7/8	7/8	7/8
Belt circumference, outside (in.)	35½		
Belt width (64ths of an inch)	37		

WEIGHT

Net weight (lbs.)	280	335	370
Shipping weight (lbs.)			

CHALLENGER & LECTRIK-ICE

Uniflow Mfg. Co., Erie, Pa.

Trade name	Challenger	Lectrik-Ice
Model No.	M-45	DM-5
Compressor Model No.	A	A

PRICE

Retail price, installed	Lacquer					
Cabinet finish, exterior	Lacquer					

CABINET DIMENSIONS

Overall height (inches)	53½	56	56	56	56	56
Overall width (inches)	23	26½	24½	28½	31½	35½
Overall depth (inches)	23½	24	24½	24½	24½	24½
Inside height (inches)	26½	27½	29½	29½	29½	29½
Inside width (inches)	19½	20½	18½	22½	25½	29½
Inside depth (inches)	15½	16½	17½	17½	17½	17½
Number of doors	1					2

STORAGE CAPACITY

Net food storage (cu. ft.)	4.6	6.0	5.02	6.03	7.04	8.04
Number of shelves	3	4				
Total shelf area (sq. ft.)	8	12	10.53	12.83	15.075	15.83
Cabinet finish (interior)	Porcelain					

INSULATION

Top (thickness in inches)	2	2½	3	3	3	3
Sides	1½	2	3	3	3	3
Back	1½	2	3	3	3	3
Door	2	2½	3	3	3	3
Bottom	2	2½	3	3	3	3

ICE CUBES

Number of shallow trays	2	3	2	3	2	2
Number of deep trays	0	0	0	0	1	1
Total number of cubes	56	84	56	84	112	112
Total weight of cubes (lbs.)	4	6	4	6	8	8

COMPRESSOR

Ice melting effect 24 hrs.	110	110	110	158	110	158
Motor horsepower	1/6	1/6	1/6	1/4	1/6	1/4
Refrigerant in system (lbs.)	1½	1½	1½	1½	1½	1½
Quantity of lubricant (oz.)	8	8	8	24	24	24
Belt circumference (in.)	35½	35½	35½	40	40	40
Belt width (64ths of inch)	44					

WEIGHT

Net weight (lbs.)	290	310	320	341	375	390
Shipping weight (lbs.)						

COMPRESSOR

Made by Uniflow, open, reciprocating, belt-driven compressor located below food compartment. Shaft seal, bellows.

Compressor Model No. A—single cylinder, 450 r.p.m., 1½-in. bore, 1-in. stroke.

Compressor Model No. B—single cylinder, 450 r.p.m., 1½-in. bore, 1-in. stroke.

Refrigerant, methyl chloride. Lubricant, white mineral oil.

CABINET

Challenger line made by Erie Art Metal Co. Hardwood frame with Temlock insulation, hard rubber breaker strip, rubber gasket. Lectrik-Ice cabinet made by Niagara. Hardwood frame, Dry-Zero insulation, bakelite breaker strip, rubber gasket.

HARDWARE

Made by Grand Rapids Brass. Chrome finish.

MOTOR

Capacitor type made by Master. Oil every 3 months.

CONDENSER

Made by Fedders Mfg. Co., fan cooled, fin tube condenser.

EVAPORATOR

Uniflow copper electro-tinned. Thermostatic refrigerant control, Detroit Lubricator expansion valve. Aluminum ice trays.

CONTROL

Ranco adjustable temperature control, mounted inside cabinet. Model No. — Manual defrosting with vacation cycle. Hand reset solder pot overload protector.

POLICY

Guarantee on Lectrik-Ice cabinet: One year.
Guarantee on Lectrik-Ice system: One year.

Serviced by: Dealers and distributors.

Replacement parts are sold to independent service companies.

Simpson Explains Methods of Determining Infiltration Through Entrance Doors

SKYTOP, Pa.—Specific data now available on determination methods for finding additions to the heat load of a building caused by infiltration of outside air through entrance doors was described to members of the A.R.S.E. at the final technical session of their meeting here last week by Arthur M. Simpson.

Mr. Simpson pointed out that there are enough coefficients and factors to enable an engineer to make a fairly accurate estimate of air conditioning loads—wall and glass areas, their construction, exposure and the like, electric lights and appliances, hot plates and gas burners, body radiation and all the rest. But that when it comes to the entrance door, however, it has been another matter.

Previously Guessed at Conditions

"The engineer may perhaps assume that since he has a plenum job air can only move out through the door at a slow velocity as determined by his plenum pressure, said Mr. Simpson. "Or again he will assume that the wind does not blow at all under maximum wet bulb design conditions, so that he can neglect the entrance. Or he will say, 'I guess that entrance ought to be equivalent to 200 or 300 c.f.m.'"

"Up to this time he has not had any accepted coefficients for entrance infiltration for different kinds of entrances and traffic."

Secured from Actual Tests

Most air conditioning coefficients have come out of laboratory experiments, but entrance infiltration was one factor in the calculation which was not adaptable to such tests, claims Mr. Simpson. There are too many factors to be duplicated. There are the varying directions and velocities of the wind and eddy currents in the city streets; the varying flow of traffic, the speed with which the traffic moves, the density and the frequency of the traffic; and the varying operation of different types of doorways. Our information which Mr. Simpson presented in his paper was secured as the result of tests run on more than 600 entrances in cities up and down the Atlantic seaboard from Washington, D. C., to Boston, Mass., and as far west as Chicago, Ill.

Three Phases of Study

The study of entrance infiltration divides itself into three phases:

(1) Entrance infiltration caused by combinations of wind pressure, chimney effect of heated buildings, and exhaust fan ventilation in the heating season.

(2) Infiltration and exfiltration caused by wind pressure acting on two or more entrances in different outside walls around a given area in which temperature and low humidity are to be maintained in the comfort zone during the hot weather season.

(3) Infiltration and exfiltration where we have a single entrance to an air conditioned area.

Since there is no measurable chimney action in buildings in the summer season the first phase is one having to do purely with the question of heating and ventilation, and not with air conditioning or refrigeration, and will therefore be neglected in this discussion.

Real Air-Conditioning Problems

The second and third phases are the real problems, as far as air conditioning is concerned. The more serious

of these is the case of entrances on two walls providing a chance for the wind to blow directly through an area, or more commonly, where the action of wind currents builds up a positive pressure at one entrance and a negative pressure at the other, causing a surprisingly large volume of air to flow in and out of the building.

The third phase, where there is single entrance or entrances in one wall only, while a much less serious problem, still presents factors and possible losses which should be taken into account by any engineer estimating an air-conditioning installation on the basis of refrigeration capacity.

Contrary to General Belief

"There is a more or less general assumption on the part of air-conditioning engineers that the wind does not blow on hot, muggy days—that high wet bulb temperatures and bright sunlight are not ordinarily accompanied by normal wind velocities," said Mr. Simpson.

"While some of our data books caution us that the effect of wind pressure on infiltration may be extremely large we have all seen examples and instruction sheets that contained statements to the effect that additional infiltration from wind may usually be neglected in summer. Our investigation shows clearly that velocity, eddy currents, and pressure areas built up by summer winds are the very cause of the entrance infiltration problem in air conditioning."

In order to find out what wind velocities could be expected during periods of high wet bulb readings a study was made of meteorological data prepared by the New York City meteorological station in Central Park.

Results of New York Study

A study in New York City of the hourly wet bulb temperature and wind velocity on a number of typical days in 1934 during which the wet bulb temperature was 75° F. or higher shows that the average wind velocity during these periods was approximately 10 m.p.h., while the average wind velocity throughout the four months during which these figures were taken was approximately 9 m.p.h.

In other words, the records of the Weather Bureau show that we can expect a greater than average wind velocity during high wet bulb periods.

Another interesting fact developed in connection with wind velocity is that there seems to be no reliable relationship between the direction of the wind, and the direction of infiltration under typical city conditions. The obstructions of buildings of various sizes and shapes cause such unexpected pressure areas and eddy currents that there are virtually no protected entrances.

Relation to Wind Direction

Where an entrance faces an unobstructed area such as a park we can naturally expect the direction of the entrance infiltration or exfiltration to be the same as the direction of the wind. However, if it is a typical store entrance in a built up business section, one will be almost certain to find an exfiltration or infiltration in the entrance on any day when there is a normal or nearly normal wind velocity—regardless of the direction in which the wind is blowing.

In checking these velocities, entrances were selected wherever possible having relatively deep and

narrow approaches between the show windows, so the flow could be measured in a channel of approximately uniform cross section.

In a great many cases the measurement was taken through vestibules which gave us very accurate results, but in many instances where a single door opened into a large room, distances of five or six feet were measured from the inside of the opening and lines were marked on the floor at these distances.

How Tests Were Made

One man standing at the doorway could reach out with the smoke puffer and make a traverse of the entrance with eight to ten puffs of smoke, while the other men in the party stationed at the line to the interior and exterior of the opening would time with an accumulative reading stop watch the total elapsed time for the travel of the smoke from the doorway to the line which had already been marked on the floor.

Approximately 200 tests in entrances to areas having doors in more than one outside wall showed entrance infiltration velocities varying from a minimum of 104 ft./min. to a maximum of 350 ft./min. With a double doorway five feet wide left wide open, an infiltration velocity of 256 ft./min. would represent a total infiltration of 9,000 c.f.m.

Another series of tests on approximately 250 entrances to areas having entrance doors in only one outside wall showing entrance infiltration velocities varying from 75 to 250 ft./min. with a mean of 165. Under this condition a double doorway wide open would permit an infiltration or exfiltration flow of 5,800 c.f.m.

Study with Hinged Doors

"While the above velocities give us a measurement of entrance infiltration in open doorways, was necessary for us to get additional data in order to determine the amount of infiltration occurring in hinged door entrances where the doors, normally in the closed position, are opened and closed as people pass through the entrance," said Mr. Simpson.

"This also is a condition where accurate information can be secured only from actual tests in the field under typical traffic conditions and typical door operation. Such tests have been conducted in more than 150 entrances."

Two Seconds Per Person

"Results of our tests and study in the laboratory and in the field showed that a measurement of the time spent from the time the door was opened one foot until it reached to within one foot of the jamb, would give a very close approximation of the effective full opening of the door when the door was used by one person."

"Of course, in actual practice in the field a number of people will pass through a door in one opening, in which case the measurement of the elapsed time the door was open in the above manner as compared to the number of people passing through greatly reduces any possibility of error."

The 150 tests on single doorways showed that the average effective door opening for a single door entrance was two seconds for each person passing through. In looking for an answer to the infiltration problem the vestibule presents itself as the most obvious solution. A similar study of vestibule entrances in more than 200 instances, however, gave rather surprising results.

Tests on Vestibule Entrances

In making tests on the vestibule entrances a similar procedure was followed as in the case of tests on single swing doors. The traffic passing through the entrance was clocked in and out and with a stop watch the time was secured of the through draft opening occurring while at least one inner and one outer door were open more than 12 inches. The watch was stopped when either the inner or outer set of doors was closed to within 12 inches of the jamb.

It was determined that in the usual busy entrance the effective duration of a through draft opening in a vestibule was one and one half seconds for each person passing through the entrance.

Only 25% Better Protection

This means that a vestibule gives only 25% better protection than a single swing door. The failure of the vestibule to give better protection comes from the fact that the flow of traffic is such that the repeated simultaneous opening of the inner and outer doors nullifies the expected protection.

Consideration of the data on the velocity of entrance infiltration together with that on door operation enables one to arrive at definite values for the volume of infiltration to be expected. Consider first the case of a building or area having doors on more than one outside wall. As determined before, with a double doorway standing open we can expect, under median conditions, an infiltration of 9,000 c.f.m. or approximately 4,500

c.f.m. for each door standing open can be expected.

Where the doors are open only while people pass in and out of the area a single doorway open two seconds with an average infiltration velocity of 256 ft./min. would produce an infiltration volume of 165 cu. ft. for each person passing through the entrance.

Likewise a vestibule under similar conditions with an effective door opening of 1.5 seconds per person would permit an infiltration of 128 cu. ft. for each person passing through the entrance.

Comparison of Results

On areas having an entrance in only one outside wall, the infiltration to be expected, under median conditions, with a double open doorway is 5,800 c.f.m. or approximately 3,000 c.f.m. for each door. Where the door is opened only to permit people to enter and leave the building an effective opening of two seconds, together with an average infiltration velocity of 165 ft./min. would show an infiltration volume of 110 cu. ft. per person passing through the entrance.

With a vestibule under these conditions and effective door opening of 1.5 seconds per person this infiltration would amount to 82 cu. ft. per person passing through the entrance.

Use of Revolving Doors

The other common type of entrance to modern buildings is the revolving door. This has been used extensively to prevent entrance infiltration under winter heating conditions where there is a marked chimney effect that creates positive suction pressure.

However, no definite values as to its effectiveness had been worked out until recently and there has been a wide variation in opinion as to the effect of entrance on summer air conditioning.

It is evident that a revolving door must displace some air as it rotates. There is, however, no positive displacement as in the case of a pump or in the case of a blower with a scroll housing. A revolving door is merely a paddle wheel set inside of a circular enclosure which moves the air around. The question was, how much air was discharged at the interior and exterior as the door rotated.

Factors Governing Displacement

The factors which govern the displacement of air by a revolving door are:

- (1) Speed of rotation of the revolving door.
- (2) Scavaging effect of air currents directed towards the compartments of the door when they are exposed at the interior and exterior of the entrance.

(3) Difference in temperature between the interior and exterior which would set up a vertical circulation of the air in each compartment as it was exposed to the interior and exterior.

Since the revolving door seals the entrance against any free flow of air, the size of the room, the height of the building and the difference in pressure between the inside and outside would have no measurable or practical effect on the displacement of air by a revolving door.

Laboratory Tests Employed

The measurement of the effectiveness of the revolving door was merely a question of measuring the efficiency of the device as a means for displacing air, and this brought us back to the laboratory where a test booth installation was built.

With this equipment three types of tests were conducted to determine the amount of displacement caused by the rotation of the revolving doors. During these tests the revolving door was rotated by having people pass through at normal speeds, entering and leaving the booth by the revolving door. In another test the door was rotated mechanically to give more uniform speeds of rotation, and in all cases the average r.p.m. was determined accurately.

Displacement Per Revolution

Since the normal operating speed of the revolving door is between 12 and 14 r.p.m., which is determined by a normal rate of walking, and since the normal speed of a revolving door is never less than 10 r.p.m., it was shown that the displacement of the revolving door tested at normal speed averaged 46 cu. ft. per revolution. Since the volume of this revolving door, which was 7 ft. in diameter by 7 ft. high, was 270 cu. ft., the revolving door is shown with an efficiency of 17% as a displacement medium, or metering device.

With 46 cu. ft. of displacement per revolution and 4 revolutions per person, a revolving door 7 ft. in diameter and 7 ft. high causes an infiltration of 18.5 cu. ft. per person passing through. With this size door this infiltration is the same summer or winter, as heating or cooling provides approximately the same scavaging velocity directed toward the entrance.

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(DUPONT METHYL CHLORIDE)

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The SPECIFICATIONS tell why!

ACIDITY—Not more than 0.001% calculated as HCl Methods of analysis furnished on request.

MOISTURE—No more than 0.008% water.

RESIDUE—Not more than 0.01% by weight.

ODOR—Characteristically ethereal, faintly sweet. No foreign odor.

COLOR—(Liquid)—Water-white and free from cloudiness.

BOILING POINT—Between -23.6° and -24.6° C., at 760 mm.

Each cylinder tested before shipment—guaranteed to meet specifications.

For modern, low-weight, compact automatic units, ARTIC meets the refrigerant requirement, viz:

- Low head pressures
- Pressure on low side above atmospheric at sub-zero temperatures
- Low piston displacement to produce a given refrigeration effect
- Relatively short time to produce a given refrigeration effect per unit volume
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For dependable refrigeration performance use ARTIC.

Technical literature on ARTIC will be sent upon request.

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NOISELESS AS A PRAIRIE NIGHT

THE GILMER V-BELT

Easy to see why consumers prefer the Gilmer V-Belt for small unit V-drives. Durable, slipless—to be sure. But here's the big reason: It's noiseless... noiseless as a prairie night. And you'll like to stock it because it comes sleeved and marked for quick identification... and because it's made in standard sizes to fit all refrigerators, air-conditioning equipment, oil burners, beer pumps, water pumps, washing machines and wood-working tools.

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MAKERS OF THE WORLD'S
BEST-KNOWN V-BELTS

ELECTRO-KOLD

E. S. Mathews, Inc., 151 Post St., Spokane, Wash.

Model No.	42	55	72	86	99
Compressor Model No.					
PRICE					
Retail price, installed					
Cabinet finish, exterior	Dulux				
CABINET DIMENSIONS					
Overall height (inches)	47 1/2	51 1/2	53 1/2	60 1/2	60 1/2
Overall width (inches)	23 1/2	24 1/2	28 1/2	29 1/2	33 1/2
Overall depth (inches)	20 1/2	23	25	25 1/2	25 1/2
Inside height (inches)	25	28 1/2	29 1/2	35	35
Inside width (inches)	18 1/2	20	23 1/2	23 1/2	25 1/2
Inside depth (inches)	15 1/2	16 1/2	17 1/2	17 1/2	17 1/2
Number of doors	1	1	1	1	1
STORAGE CAPACITY					
Net food storage (cu. ft.)	4	5.25	6.7	8.4	8.7
Number of shelves					
Total shelf area (sq. ft.)	8.5	11.04	14.5	17.2	20.25
Cabinet finish (interior)	Porcelain				
INSULATION					
Top (thickness in inches)	1 1/2	2 1/2	2 1/2	3	3
Sides	2	2	2 1/2	3	3
Back	2	2	2 1/2	3	3
Door	2	2	2 1/2	3	3
Bottom	2	2	2 1/2	3	3
ICE CUBES					
Number of shallow trays	2	4	5	6	7
Number of deep trays	0	0	0	1	1
Total number of cubes	36	58	77	133	133
Total weight of cubes (lbs.)	2.7	4.5	7	11.5	11.5
COMPRESSOR					
Ice melting effect 24 hrs. (lbs.)	96	96	96	180	180
Motor horsepower	1/6	1/6	1/6	1/5	1/5
Refrigerant in system (lbs.)	1	1	1	1	1
Quantity of lubricant (pts.)	1/2	1/2	1/2	1/2	1/2
Belt circumference (inches)					
Belt width (64ths of an inch)					
WEIGHT					
Net weight (lbs.)	190	365	400	420	460
Shipping weight (lbs.)					

COMPRESSOR

Compressor on models 42, 55, and 72—single cylinder, 430 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Compressor on models 86 and 99—twin cylinder, 400 r.p.m., 1 1/2-in. bore, 1 1/4-in. stroke.

Made by Universal Cooler, open, reciprocating, belt-driven compressor located below food compartment. Shaft seal, bellows.

Refrigerant, methyl chloride. Lubricant, Argon.

CABINET

Made by Sanitary. Wood frame with Hermetex insulation, Saniwood breaker strip, rubber gasket.

HARDWARE

Made by Winters & Crampton. Chromium finish.

MOTOR

Capacitor type made by Delco. Oil semi-annually.

CONDENSER

Made by — fan cooled, radiator type condenser.

EVAPORATOR

Made by Universal Cooler. Copper and brass, direct expansion evaporator. Temperature and expansion valve refrigerant control, Detroit expansion valve. Copper and aluminum ice trays. Metal and quick release type.

CONTROL

Ranco adjustable temperature control. Model No. —, mounted inside the cabinet. Semi-automatic defrosting. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: One year.

Serviced by: Dealer.

Replacement parts are sold to independent service companies.

SPECIAL FEATURES

All models with interior electric light and larger models with frozen products compartment. Deluxe models with sliding vegetable baskets.

Invisible Kitchen Co. Appoints Outlets in St. Louis, New York

ST LOUIS—Modernized Equipment, Inc., newly appointed distributor for Electric Invisible Kitchen Co. in the states of Missouri and Iowa, recently opened new offices and display rooms at 1500 Market St. here.

Designed especially for the display and sale of Electric Invisible Kitchen Co.'s line of 12 models, and involving an expenditure of approximately \$14,000, the new showroom has a section converted into a built-in two-room bungalow, equipped with an Electric Invisible Kitchen S-S-6-0 De Lux Special in one room, and a Bar-ette in the other (a living room). A chrome and black decorative scheme is accentuated by the Chinese red finish of the Bar-ette.

Officers of Modernized Equipment are: David Israel, president; Samuel Stein, previously connected with the National Cash Register Co., sales manager; and Fred J. Hardesty, secretary.

Activities of Electric Invisible Kitchen in New York City have also been enlarged, reports E. L. Bennett, vice president and general manager. Known as Electrical Invisible Kitchen Sales Co., the New York City organization has its show rooms and general offices in the Lincoln building at 60 E. 42nd St. E. E. Langguth is in charge.

Besides its New York and St. Louis selling organizations, Electric Invisible Kitchen recently appointed Manufacturers Sales Co., Miami Beach, as distributor for Florida.

Other distributors are: J. E. Stephens Co., Detroit; Laird & Co., Boston; Frank R. Rosen, Philadelphia; Greene-Winkler Co., Seattle; and North-Bell Hardware Co., Dallas.

Central offices of Electric Invisible Kitchen were recently moved into new and larger quarters in the La Salle-Wacker building, Chicago, where the firm now has five rooms and complete display facilities.

1000 Refrigerators Are in Use in Panama

PANAMA CITY—Although the number of household electric refrigerators in use in Panama has been restricted by the native habit, adhered to even by well-to-do families, of purchasing a day's supply of food each morning, there are approximately 1,000 domestic electric refrigerators in use in Panama City and Colon today, according to the Panama Light and Power Co.

Because of this custom, there is no incentive to preserve left-overs, or to stock large quantities of foods, and the widespread use of household electric refrigeration has been held back. Many well-to-do families do not even maintain an ice box; servants are sent to the grocery store for five or ten cents worth of ice whenever it is required.

In the Panama Canal Zone, where there are now approximately 1,500 electric refrigerators installed, an entirely different situation exists. Here (the power company states) most of the families, especially American-born residents, who do not have electric refrigeration have some type of ice box which satisfactorily preserves food.

Vining Will Address Chicago Buyers Club

CHICAGO—Vernon E. (Sam) Vining, director of department store sales for Westinghouse Electric & Mfg. Co., will be principal speaker at the 14th Floor Mart Club buyer luncheon to be held in the Merchandise Mart July 7, announces Club president C. S. Keating.

More than 500 merchandise managers, buyers, and manufacturers are expected to attend the luncheon as guests of the club. The event will be a highlight of the International Home-furnishings Markets in which major electrical appliances will be featured along with furniture, floor coverings, and other housewares articles.

Mr. Vining, author of "Sam's Selling Slants," and well known authority on department and retail store sales problems, will speak on "Phases of Sales Training."

Anchor Lite Betters 1935 Sales in 5 Months

PITTSBURGH — May sales established two new records for Anchor Lite Appliance Co., Crosley distributor here. During the last week in May, the company sold more Sheldor electric refrigerators than it sold during the entire month in 1935, and total business booked for the period ending May 30, 1936, was greater than for the whole 1935 selling season, states President Harold W. Goldstein.

COLDSPOT

Sears, Roebuck & Co., Chicago, Ill.

Model No.	7516	7517	7518	7519	7520	7521
Compressor Model No.	T5	W6	Y6	Y6	Z6	Z6
PRICE						
Retail price, installed	\$94.50	\$124.50	\$149.50	\$169.50	\$169.50	\$189.50
Cabinet finish, exterior	Synthetic Enamel			Porc.	S. Enam.	Porc.

CABINET DIMENSIONS

Overall height (inches)	51 1/2	57 1/2	59 1/2	59 1/2	63 1/2	63 1/2
Overall width (inches)	24 1/2	30	30	30	33 1/2	33 1/2
Overall depth (inches)	23 1/2	25	28 1/2	28 1/2	28 1/2	28 1/2
Inside height (inches)	27 1/2	31 1/2	31 1/2	31 1/2	36 1/2	36 1/2
Inside width (inches)	19 1/2	23 1/2	23 1/2	23 1/2	27 1/2	27 1/2
Inside depth (inches)	15	15 1/2	15 1/2	15 1/2	15 1/2	15 1/2
Number of doors	1					

STORAGE CAPACITY

Net food storage (cu. ft.)	4.24	6.30	6.31	6.31	8.33	8.33
Number of shelves	3	4	5	5	6	6
Total shelf area (sq. ft.)	9.24	12.19	13.04	13.04	18.08	18.08
Cabinet finish (interior)	Porcelain					

INSULATION

Top (thickness in inches)	2 1/2	3	3	3	3	3
Sides	2	3	3	3	3	3
Back	2	3	3	3	3	3
Door	2	3	3 1/2	3 1/2	3 1/2	3 1/2
Bottom	2	3	3	3	3	3

ICE CUBES

Number of shallow trays	2	3	4	4	4	4
Number of deep trays	0	0	1	1	1	1
Total number of cubes	64	96	105	105	138	138
Total weight of cubes (lbs.)	5	7 1/2	8	8	11	11

COMPRESSOR

Ice melting effect 24 hrs.	120	120	150	150	180	180
Motor horsepower	1/6	1/6	1/5	1/5	1/4	1/4
Refrigerant in system (lbs.)	Less than 2 lbs.					
Quantity of lubricant (pt.)	3/4	3/4	3/4	3/4	3/4	3/4
Belt circumference	No belts					
Belt width	No belts					

WEIGHT

Net weight (lbs.)	228	298	340	358	375	405
Shipping weight (lbs.)						

COMPRESSOR

Made by Sunbeam Electric Mfg. Co., open, rotary, direct-driven compressor located above food compartment, 1,725 r.p.m. Shaft seal, bellows.

Refrigerant, sulphur dioxide. Lubricant, Argon ice machine oil.

CABINET

Made by —. Wood frame with Balsam Wool (7516) and Dry Zero (all others) insulation, Tylac (7516) and bakelite (all others) breaker strip, rubber gasket.

HARDWARE

Made by National Lock. Brass with chrome-plated finish.

MOTOR

Single-phase condenser type made by G-E and Delco. Oil every six months.

CONDENSER

Made by Bush and McCord, fan cooled, fin and tube condenser.

EVAPORATOR

Made by Sunbeam, copper and brass shell type (tubing soldered to shell). Detroit Lubricator expansion valve refrigerant control.

Anodic aluminum ice trays with trigger release.

CONTROL

General Electric adjustable temperature control mounted inside cabinet.

Control Model No. G226 (7516 and 7517), manual defrosting with vacation cycle.

Control model No. G53 (7518 and 7519) and G54 (7520 and 7521) have semi-automatic defrosting with vacation cycle.

Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: One year.

Guarantee on system: Five years.

Serviced by: Sears, Roebuck & Co.

Replacement parts are not sold to independent service companies.

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Uncovering the Convention

Notes on the A.S.R.E. Spring Meeting

By Phil B. Redeker

Mr. Goodman Stirs Up A Little Excitement

Paper which got the most attention and which aroused the most discussion at the technical sessions was "Dehumidification of Air Conditioning Coils" by William Goodman of the Trane Co.

Mr. Goodman presented findings which controverted some of the data which other manufacturers have adhered to.

N. B. Pownall, who has done considerable experimental work on the determination of heat transfer factors in coils for York Ice Machinery Corp., declared that actual tests made by York had demonstrated that leaving air temperatures from a cooling surface would be on a straight line on the psychrometric chart, when plotted against B.t.u.'s per hour.

It seemed that Mr. Goodman had been contending against the "straight-line" law governing the temperatures of air passing over a cooling coil as established by Pownall and other authorities in previous papers. But since Mr. Goodman seemed to agree with Mr. Pownall's discussion on the convention floor, perhaps the disagreement was not as great as it seemed.

Mr. Pownall also questioned some of the speaker's findings with respect to the portion of the paper dealing with "fogged surface," a condition of saturated air that might become possible when the refrigerant temperature is very low or the initial dew point temperature of the air is high.

Another York engineer, Charles Dodson, said that in studying Mr. Goodman's paper he couldn't make the figures check to make a heat balance, and he also posed a question concerning an apparent lack of data on overall film coefficients. Mr. Goodman explained with respect to the latter matter that it had not been the purpose of the paper to determine overall film coefficients, and that such data as was mentioned was only incidental to the paper.

Joe Askin, Fedders Mfg. Co. chief engineer, stated that experiments conducted by Fedders tended to bear out some of Mr. Goodman's findings, particularly with respect to the ratio of sensible to latent heat. Mr. Askin also declared that in a large coil with 15 to 20 rows a saturated condition such as described by Mr. Goodman was found possible, with heat removal apparently along the lines suggested in the paper.

Coil Engineers Turn Out To Hear Mr. Goodman

R. T. Swartt of General Refrigeration Sales Co. (Lipman equipment) asked if there was not a great change in the heat transfer coefficient from a point at the refrigerant inlet to the coil at a point at the refrigerant outlet, and if therefore the coils did not have to be divided into rather small sections if accurate data were to be taken.

This was very much the case, said Mr. Goodman, and he listed as other problems the proper distribution of refrigerant throughout the entire coil, and pressure drop.

Pressure drop shouldn't be more than 3 lbs. per square inch to give maximum results in commercial work, Mr. Goodman said.

Other engineers specializing in coil manufacturing or application work whom we spotted included Lester U. Larkin and Carl Conkey of the Larkin company; D. P. Heath of McCord

Radiator, C. T. Bappler of Bush Mfg. Co., F. H. Faust of the G-E Air Conditioning Department, and Al Knapp and H. M. McGaughey of Kelvinator Corp.

In the discussion following S. Rupprich's paper on "Defrosting" Crosby Field stated that he had heard that a new chemical defrosting substance known as "Killfrost" was finding favor in some places, but no one seemed to have any knowledge of it. The general method of chemical defrosting was discussed by Mr. Rupprich in his paper.

Concerning the problem of "Brewery Refrigeration" as discussed by Walter Jones of Carrier Corp., the question was asked by Crosby Field as to whether or not special metals were needed where brine spray equipment was employed. In reply, Mr. Jones said that galvanized metal had been used with success, and that aluminum was also very satisfactory.

L. L. Lewis, in discussing the paper by Morrow on increases in water capacity that may be caused by air conditioning, said that data accumulated a few years ago showed that air conditioning resulted in a maximum consumption of 300 gallons per person and an average of 43 gallons per person, in an air-conditioned space.

These figures, he believes, were more than cut in half during 1935 by the use of cooling towers and other devices.

When air conditioning begins to press municipal water supplies, it will be the pumping capacity of the system that will be pinched first, said Mr. Lewis, although the matter of entire capacity will also present a problem in time, he declared.

An Ice Industry Representative Makes Some Admissions

Clifford Holske, commercial engineer for the American Ice Co., made some startling admissions about the ice box industry in his talk on "Domestic and Commercial Ice Refrigerators."

"By 1920," he said, "tremendous quantities of unsatisfactory ice boxes were being unloaded upon the public each year, the mechanical refrigerator was assuming some importance as a competing service, and the ice industry was too busy worrying about the various methods of manufacturing ice to be concerned about the permanence of the market for its product."

"The advent of the mechanical refrigerator, accompanied by untold millions of dollars worth of advertising material, created new standards of household refrigeration and attained public acceptance for these standards."

In the discussion on the floor following his paper Mr. Holske made claims of very low operating temperatures in ice refrigerators, but admitted that when the ice block melted down to 20 to 25% of its original size, the temperature rise in the cabinet would be very, very rapid.

The time: about midnight the night of the A.S.R.E. convention dinner-dance at the Skytop club. The place: a dim, deserted hallway not very far from the club's bar where much merriment was evident. The mood: serious. The principals: Dan Wile, chief engineer of Detroit Lubricator's refrigeration division, and Joe Askin, Fedders' chief engineer. The plot: expansion valves.

Engineers Renew Old Friendships at Skytop Conclave



Left: Between sessions of last week's ASRE meeting at Skytop, Pa., George Bright, well-known Detroit consulting engineer, and Charles Haven, president of Thermopane Co., meet on the golf course for an informal chat. Right: From the clubhouse porch H. C. Guild (leaning against railing), New York City manager for Vilter Mfg. Co., E. T. Williams, consulting engineer, and A. H. Eustis of Virginia Smelting Co. watch a foursome tee off.

Engineers Win High Place As Argumentative Experts

In the popular mind lawyers are the great "argufiers" but for some real high-class fervid "argufying" we cast our vote for the engineers, when their interest is aroused. The following story (which comes to us in good faith) gives you an idea.

It seems that one of the speakers at last week's convention was passing by a room from which came sounds indicating that a very heated discussion was taking place—and he caught just enough of the words to discover that his paper was the subject matter involved.

He did not know the men in the room, and he didn't want to eavesdrop, but he couldn't resist the temptation to get into what sounded like the makings of a mighty fine argument so he finally rapped on the door and asked if he couldn't join the discussion of his own paper!

Mr. Rupprich's Antidote for Convention Slumbering

Siegfried Rupprich, popular and respected German-educated consulting engineer of New York City, did double duty at the Monday morning session, delivering not only his own paper on "Defrosting" but also presenting the paper on "A Review of Fish Refrigeration Methods" prepared by D. B. Finn of Canada's Biological Board.

In prefacing his remarks, Mr. Rupprich drying remarked that he would give only an abstract, as "the reading of papers in their entirety accounts for the large scale slumbering which is evident at the technical sessions."

In the case of Mr. Rupprich's article on "Defrosting" it was perhaps too bad that he didn't read the entire paper, as his audience evinced considerable interest in the subject, but all those who got to their feet to discuss it admitted that they hadn't read the preprints.

According to Mr. Rupprich, a new development in compressor design that should be of interest to the small-machine field is being patented by Carlos Zorzi, Italian inventor residing in New York City.

Freon's Well Known Team Prominent at Convention

Very attentive at the technical sessions, and very gay at the social functions, were the two men who spell "Freon" to the industry—W. W. "Dusty" Rhodes and R. J. Thompson. "Dusty" engaged in some friendly verbal jousting with E. T. Williams, consulting engineer. Mr. Williams took an active part in the New York code hearings, and was more or less with the opposition to Freon. Incidentally there seemed to be rumors in the air that some interesting news is due to break on the refrigerant system in the near future.

"Dusty" proved himself one of the few hardy souls at the convention by taking a dip in the Skytop outdoor swimming pool (temperatures ranged around 50° F. most of the time at Skytop, and at times dropped down into the 40's).

Mrs. Harry Williams, wife of the Frigidaire engineer and A.S.R.E. vice president, was the victim of an unfortunate accident the first morning of the convention. While riding one of these new-fangled "bouncing bikes" she lost her footing and suffered a sprained ankle.

Forced to spend the rest of the convention period in a wheel chair, she smiled off attempts at commiseration and was among the gayest of the feminine contingent at the various social functions.

Another accident victim at the convention was Jack Robineau, representative in Paris, France, for Melchior, Armstrong, Dessau Co. He claimed he threw his eyelid out of joint in a tennis match.

This led H. E. Dawson of the Fulton Sylphon Co. to remark that he had seen guys with their eyelids out in "joints," but never knew of any one getting their eyelid "out of joint."

Camera Addicts Enable News To Cover Convention Pictorially

We met for the first time at the convention W. B. Williams of Utilities Engineering Institute's New York City branch. A camera addict (we are indebted to him for several of the shots in this issue), his knowledge of photography and equipment were the envy of other camera addicts at the meeting.

Earlier this year Mr. Williams took a three weeks' leave from his work to take photographs for the Columbian Steamship line, which photographs were used in the steamship line's advertising in class magazines. Some of the pictures which Mr. Williams took at the convention appear in this issue. Others who contributed pictures which we are publishing were Jack Schaefer of York Ice Machinery Corp.

(former Engineering Editor of ELECTRIC REFRIGERATION NEWS) and Dan Wile of Detroit Lubricator.

J. T. Forbes of Kerotest Mfg. Co. was another busy picture-taker at the convention. He promised to send us some of his prints but we haven't seen them yet. With Mr. Forbes was Ken Newcum, author of the MASTER SERVICE MANUAL, whose "Commercial Refrigeration Manual" is soon to start in the News.

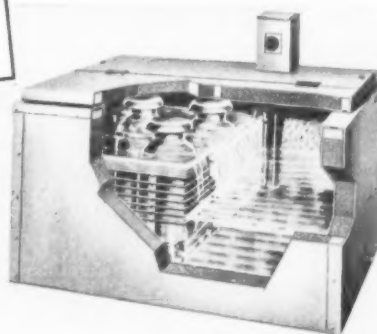
Refrigerant interests were well represented at the meeting. In addition to Messrs. Rhodes and Thompson of Kinetic Chemicals, others present included A. H. Eustis of Virginia Smelting Co., Ed McGovern of R. & H. Chemicals, Harry Edwards of Union Carbide & Carbon, and Bob Quinn of Mathieson Chemical. In spite of the divergence of interests represented, comparative peace and quiet reigned.

H. E. Rieckelman, vice president of Fedders Mfg. Co., had a busy three days facing him immediately following the convention, with a conference of Fedders branch managers and sales agents, and the annual Fedders summer outing, in which 1,500 employees and their friends were expected. "Rick" was keeping a watchful eye on his Chief Engineer Joe Askin, as Joe was scheduled to be one of his star performers at the sales meeting.

Consider these 4 important points when you choose equipment insulation

1. Low thermal conductivity
2. Complete dependability
3. Easy installation
4. Sales advantage of nationally-famous name

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Armstrong's Temlok
JUST AS **ESCO** DID!



New ESCO NI-AG-RA Milk Cooler which is insulated throughout with Armstrong's Temlok. Its makers are the Esco Cabinet Company, of West Chester, Pa.

NOT one... but four big advantages recommend the use of Armstrong's Temlok for any type of refrigerated equipment! Fabricated from the heartwood of the southern pine, this efficient insulation has a thermal conductivity of only .28 B.t.u.! More than that, Temlok assures long and satisfactory service because it resists moisture, fits snugly, doesn't settle or pack.

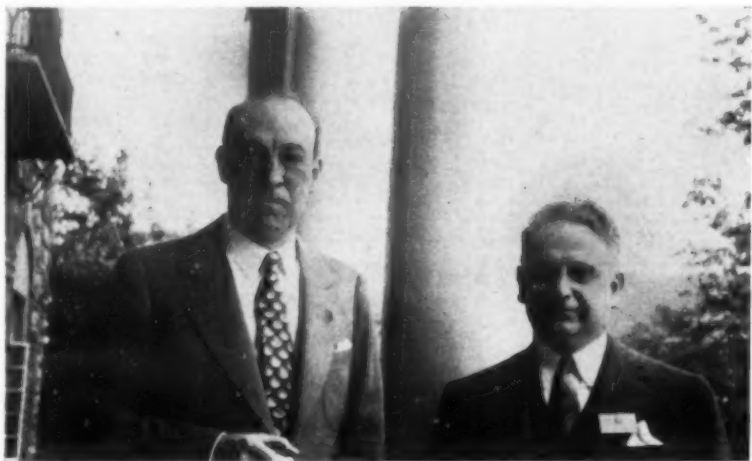
Temlok is easy to install, too! For your convenience it is supplied in factory-fabricated sets ready for use.

You can secure Temlok cut to size in any thickness. You'll find that Temlok insulated refrigerators are more economical to build... and easier to sell! Businessmen and homeowners know Armstrong as the maker of famous Armstrong's Linoleum and other high quality products. For complete information and samples of Temlok Refrigerator Insulation, write Armstrong Cork Products Co., Building Materials Division, 924 Concord Street, Lancaster, Pennsylvania.



ARMSTRONG'S TEMLOK REFRIGERATOR INSULATION

The Men Behind Freon



Prominent and popular at last week's ASRE convention at Skytop were these two executives of Kinetic Chemicals, Inc., manufacturer of Freon refrigerants: W. W. (Dusty) Rhodes, sales manager, and R. J. (Tommy) Thompson, chief engineer.

FEDERAL

Federal Refrigerator Corp., 57 E. 25th St., New York City.

Model No.	4-S	6-S	66-S	91-S
Compressor Model No.	RU-3	RU-3	RU-3	RU-4

PRICE

Retail price, installed	Not fixed			
Cabinet finish (exterior)	Dulux			

CABINET DIMENSIONS

Overall height (inches)	53 1/2	58 1/2	65	70 1/2
Overall width (inches)	23 1/2	30	30 1/2	33 1/2
Overall depth (inches)	21 1/2	24 1/2	24	24
Inside height (inches)	26 1/2	31	34	39 1/2
Inside width (inches)	19 1/2	23 1/2	23 1/2	26 1/2
Inside depth (inches)	15 1/2	17 1/2	16	16
Number of doors	1			

STORAGE CAPACITY

Net food storage (cu. ft.)	4.2	6.5	6.96	9.1
Number of shelves	3	5	6	5
Total shelf area (sq. ft.)	8.5	13.03	12.73	15.38
Cabinet finish (interior)	Porcelain			

INSULATION

Top (thickness in inches)	2	3	3	3
Sides	2	3	3	3
Back	2	3	3	3
Door	2	3	3	3
Bottom	2	3	3	3

ICE CUBES

Number of shallow trays	3	2	2	3
Number of deep trays	0	1	1	1
Total number of cubes	63	112	112	140
Total weight of cubes (lbs.)	5	9	9	12

COMPRESSOR

Ice melting effect 24 hrs. (lbs.)	105	105	145	145
Motor horsepower	1/6	1/6	1/6	1/5
Refrigerant in system (lbs.)	3			
Quantity of lubricant (pt.)	1			
Belt circumference (inches)	39 1/2	39 1/2	39 1/2	38
Belt width (64ths of an inch)	32			

WEIGHT

Net weight (lbs.)	265	359	405	475
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COMPRESSOR

Made by Jomoco, Inc., open, reciprocating, belt-driven compressor located below food compartment. Balanced shaft seal.

Compressor Model No. RU-3—single cylinder, 490 r.p.m., 1 1/2-in. bore, 1 7/10-in. stroke.

Compressor Model No. RU-4—twin cylinder, 350 r.p.m., 1 1/2-in. bore, 1 7/10-in. stroke.

Refrigerant, sulphur dioxide. Lubricant, 150 viscosity.

CABINET

Made by Seeger Refrigerator Co. Spruce frame with Celotex insulation. Formica breaker strip, rubber gasket.

HARDWARE

Made of brass with chrome finish. Bakelite trim.

MOTOR

Capacitor type made by General Electric. Oil semi-annually.

CONDENSER

Made by Bush, fan cooled, finned tube condenser.

EVAPORATOR

Made by Mullins and Peerless. Copper coils soldered to bottom of sleeves. Enameled pressed steel shell.

American Injector expansion valve refrigerant control.

Aluminum ice trays.

CONTROL

Tagliabue adjustable temperature control, models R-18 and R-19, mounted inside the cabinet. Manual defrosting. Hand reset solder pot overload protector.

POLICY

Guarantee on cabinet: Seeger policy.

Guarantee on system: One year.

Replacement parts are sold to independent service companies.

SPECIAL FEATURES

Models 4-S and 6-S—glass chiltray. Models 66-S and 91-S—glass chiltray, drawer-type hydrator and utility basket, dry-storage drawer, electric light.

Method of Computing Refrigerator Shelf Area & Capacity

For the guidance of its members in computing various domestic refrigerator dimensions, the Refrigeration Division of the National Electrical Manufacturers Association in May, 1931, adopted the standard methods shown below. These methods, it is hoped will prove of equal value to non-members of the division. Their use by all manufacturers of domestic refrigerators should aid greatly in standardizing the statistical data of the industry.

Inside Depth—The inside depth of the cabinet shall be the distance between the inside door pan and the rear lining.

Inside Width—The inside width shall be the distance between the inner surface of the side walls of the lining.

Inside Height—The inside height shall be the distance between the inner surface of the floor and ceiling of the cabinet.

Net Food Storage Volume—The net food storage volume shall be the gross cubic content minus the volume taken up by the cooling unit, baffles, or other parts plus the volume of the ice freezing or food storage compartment contained within the cooling unit.

Depth of Cooling Unit—(a) The depth of the cooling unit shall be taken as the depth of the cabinet as heretofore defined.

(b) Exceptions to this may be noted only if there is a clear space of four inches or greater in front or back of the cooling unit, baffle, or ice tray pulls, to the inside front or back of the cabinet as measured for depth and this space arranged for food storage.

(c) In this case the depth of the cooling unit shall be taken as the distance from the rear wall of the inner liner to the foremost part of the cooling unit, ice tray pulls, or baffle, whichever is the greater, or from the inner surface of the door to the rearmost portion of the cooling unit.

Width of Cooling Unit—(a) The width of the cooling unit shall be taken as the greatest outside width of the cooling unit itself, or if side baffles are used, the over-all width including the baffles, whichever is the greater.

(b) If there is less than a four-inch space between the unit or baffle and the side of the inner lining, the distance from the inner lining to the outer surfaces of the cooler unit or baffle (whichever is the greater) shall be used as the width.

Height of Cooling Unit—(a) The height of the cooling unit shall be the distance from the ceiling of the cabinet as previously used for inside height to a plane horizontal with a mean point on the bottom of the drip tray or the lower baffle, whichever is the greater.

(b) On non-automatic defrosting type cooling units the space occupied by the drip tray may be included in the net food storage volume if the drip tray is of the removable type and usable as food storage space.

(c) The space directly above the cooling unit shall not be included in the net cubic volume except in cases where the unobstructed storage space is greater than four inches in height specifically arranged for food storage and is readily accessible.

(d) The volume of the ice freezing compartments or low-temperature food storage compartments shall be included in the net food storage volume.

(e) The volume of these ice freezing compartments shall be calculated from the inside dimensions of the sleeve.

(f) In the case of low-temperature food storage compartments, the net volume shall be computed as heretofore defined, each compartment being considered as a separate refrigerator.

Food Storage Shelf Areas—(a) Food storage shelf area shall include the area of shelves and the area of the bottom of the liner as hereinafter defined.

(b) In calculating the area of full shelves and of the bottom of the liner, the inside width and depth of the cabinet, as previously defined, shall be used.

(c) When any shelf is recessed, the area of the recess shall be deducted. The width and depth of the recess shall be the distance from the edges of the recess to the adjacent interior surfaces as used in figuring gross storage volume.

(d) In computing the area of fractional shelves, the width and depth of the shelves shall be the distances from the adjacent interior surfaces of the cabinet to the outer edges of the shelf.

(e) For fractional shelves adjoining the evaporator compartment, the width of the shelf shall be the interior width of the cabinet minus the width of the evaporator compartment as heretofore defined under "Food Storage Capacity."

(f) Whenever the space occupied by the drip tray is included in the net food storage volume the part of the shelf supporting the drip tray may be considered as food shelf area; otherwise it shall not.

(g) The area of the bottom of the individual ice freezing or low-temperature storage compartments, included as a part of the cooling unit, shall be considered as food shelf area; the width and depth dimensions used in computing their volumes to be used in calculating the food shelf area.

(h) The area of the bottom of containers arranged to be suspended from any cabinet shelf shall be considered as food storage shelf area.

(i) The area of that part of the shelves having less than four inches of clearance above shall not be counted, except as otherwise specified in 9 (f), (g), and (h).

Volumes and Areas—(a) Gross and net food storage volumes shall be reported to the nearest 0.1 cu. ft.

(b) Food shelf areas shall be reported to the nearest 0.1 sq. ft.

HOSTESS

Hostess Corp., Ltd., 101 Hanson St., Toronto, Ont., Canada.

Model No.	406	506	606	706
Compressor Model No.	Open	Sealed		

PRICE

Retail price, installed	\$179.00	\$199.00	\$246.00	\$277.00
Cabinet finish, exterior	Porcelite (Lacquer)			

CABINET DIMENSIONS

Overall height (inches)	50 1/2	50 1/2	54	57 1/2
Overall width (inches)	25 1/2	25 1/2	28	29 1/2
Overall depth, including hardware (inches)	25 1/2	25 1/2	26 1/2	27
Inside height (inches)	26 1/2	26 1/2	30	31 1/2
Inside width (inches)	19 1/2	19 1/2	21 1/2	23
Inside depth (inches)	18 1/2	18 1/2	18 1/2	19 1/2
Number of doors	1			

STORAGE CAPACITY

Net food storage (cu. ft.)	4.5	4.5	5.5	6.5
Number of shelves	4	4	4	4
Total shelf area (sq. ft.)	10.0	9.5	10.8	12.0
Cabinet finish (interior)	Porcelain			

INSULATION

Top (thickness in inches)	2 1/2	2 1/2	3 1/2	3 1/2
Sides	2 1/2	2 1/2	3	3 1/2
Back	2 1/2	2 1/2	3	3 1/2
Door	2 1/2	2 1/2	2 1/2	3
Bottom	3 1/2	3 1/2	3 1/2	4

ICE CUBES

Number of shallow trays	1	1	1	2
Number of deep trays	1			
Total number of cubes	63	63	63	84
Total weight of cubes (lbs.)	4 1/2	4 1/2	4 1/2	6

COMPRESSOR

Ice melting effect per 24 hours (lbs.)	100			
Motor horsepower	1/6	1/6	1/6	1/6
Refrigerant in system (lbs.)	1 1/2	3 1/2	3 1/2	3 1/2
Quantity of lubricant (Imp. gal.)	1/3			
Belt circumference (inches)	No belts			
Belt width (64ths of an inch)	No belts			

WEIGHT

Net weight (lbs.)	315	345	370	395
Shipping weight (lbs.)	375	400	430	475

COMPRESSOR

Made by Hostess, 1,725 r.p.m. (25 cycle), 1,425 r.p.m. (60 cycle), sealed, rotary, direct-driven compressor located below food compartment. Compressor on model 406 is conventional (open) type.

Refrigerant, sulphur dioxide. Lubricant, Sun Oil Co.

Shaft seal, none on sealed unit, double seal on open model.

CABINET

Made by Hostess. Hardwood frame with "Hostex" insulation, Tylac breaker strip, balloon type rubber gasket.

HARDWARE

Made by Winters & Crampton. Chromium-plated finish.

MOTOR

Capacitor type, made by Canadian General Electric. Permanently oiled (except model 406, which should be oiled semi-annually).

CONDENSER

Made by Hostess, natural draft cooled, finned tube condenser.

EVAPORATOR

Made by Hostess, copper (electro-tin plated) fin type.

Float valve refrigerant control, Hostess expansion valve.

Aluminum ice trays. Automatic tray release and rubber tray (except 406.)

CONTROL

Cutler-Hammer adjustable temperature control. Model 9502 Type G, mounted inside cabinet. Fully automatic defrosting on all but model 406. Hand reset bimetal overload protector.

POLICY

Guarantee on cabinet (including control): One year.

Guarantee on system: Three years on hermetic unit, including evaporator. Serviced by: Hostess.

Replacement parts are not sold to independent service companies.

SPECIAL FEATURES

Controlled humidity, Servador, and interior electric light in all except No. 406.

EXPERTS? It has been truthfully stated that many "experts" are just ordinary fellows—a long way from home. Being ordinary fellows ourselves, we like this definition and take pride in being a long way ahead of usual methods and procedures in the manufacture of **PISTONS** for refrigeration and air conditioning compressors. We offer to manufacturers of all types of compressors the benefit of our specialized experience in the fabrication of pistons—at competitive prices. May we render quotations for your needs?

SPENCER SMITH MACHINE CO.
HOWELL, MICHIGAN

ROTARY SEAL REPLACEMENT UNITS FOR REFRIGERATOR COMPRESSORS



- QUICKLY AND EASILY INSTALLED
- SAVE TIME AND TROUBLE
- PREVENT SHAFT LEAKS

With the many acknowledged advantages, **ROTARY SEAL UNITS** are unquestionably the most perfect replacement seal units available.

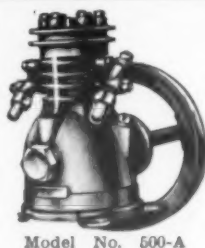
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GUARANTEED TO GIVE PERFECT SATISFACTION
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801 W. Madison St. Chicago, Ill.

PEERLESS THERMAL EXPANSION VALVES

for Methyl Chloride & Sulphur Dioxide

1. No bellows to leak.
2. No possibility of moisture condensation interfering with valve action.
3. Tried & proven in every section of the country.
4. Competitively priced.

PEERLESS ICE MACHINE CO.
CHICAGO TWO FACTORIES NEW YORK
515 W. 35th St. 43-00 36th St., L.I.C.



"CHIEFTAIN" QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

All bearings diamond bored. Positive lubrication of piston by newly developed process plus forced feed lubrication in all models.

Sizes: 1/6, 1/5, 1/4, 1/3 h.p.

Write for prices

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1002 Palms Bldg.

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Puro ELECTRIC WATER COOLERS

Thoroughly reinforced all steel attractively finished cabinets.
Complete line of different Models and Capacities.

Write for details and sales prices.

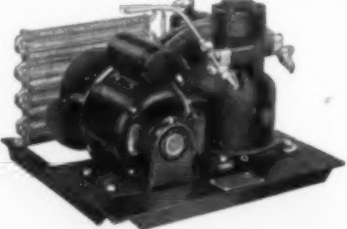
Puro Filter Corporation of America

440 Lafayette Street, New York City Spring 7-1800

CONDENSING UNITS and COMPRESSORS FOR HOUSEHOLD REFRIGERATION BY

JOMOCO, INC.
A SUBSIDIARY OF THE
JOHNSON MOTOR CO.

Waukegan, Ill.
CABLE ADDRESS: JOMOCO-WAUKEGAN



Classified

RATES: Fifty words or less, one insertion, \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

SALES MANAGER or representative for items sold on large contracts. Well acquainted with engineering, purchasing and production executives of nearly all manufacturers of mechanical and ice refrigerators in entire country. More than ten successful years in present position. Legitimate reason for wanting to change. Favor promotional work on new product of merit where acquaintance will be an asset. Not a cheap man but one who can get results. Single, so no objection to extensive traveling. Address Box 807, Electric Refrigeration News.

FRANCHISE AVAILABLE

MY HEALTH will not permit me to work 24 hours a day. Therefore, I must sell my Kelvinator commercial distributorship franchise. Service alone will better than pay all expenses. I have two service trucks, good stocks of parts and supplies, dandy service contracts and no indebtedness. Price is reasonable. Box 809, Electric Refrigeration News.

EQUIPMENT WANTED

WANTED TO BUY—General Electric hermetic sealed units, household models preferred. REX REFRIGERATION SERVICE, INC., 446-48 East 79th Street, Chicago.

EQUIPMENT FOR SALE

CABINETS—closeouts—1935 and 1936 high-grade cabinets—steel frame—Balsam Wool insulation—attractive styling—4, 5, 6 & 8 Cu. Ft. Dulux models—6 & 8 Cu. Ft. all porcelain models—excellent condition—low prices. Write or wire MIDWEST STAMPING & ENAMELING COMPANY, Morrison, Ill.

REFRIGERATOR DEALERS! Make money with Federal's reconditioned refrigerators. 1000 refrigerators such as Frigidaire, G. E., Kelvinator, Electrolux, etc., completely remanufactured and rebuilt, some as is, as low as \$15; also hundreds of new refrigerators priced for promotional purposes. FEDERAL REFRIGERATOR CORP., 57 East 25th St., New York.

STANDARD WATER cooled condensers new—repaired—exchanged. New replacements for Frigidaire Model N, \$19.00; for Model C, \$26.00. Model N Frigidaire condenser repaired or exchanged, \$10.00; Model C, \$15.00. Send for our new bulletin, just issued, illustrating Standard evaporators, condensers, fin coils. STANDARD REFRIGERATION PARTS COMPANY, 5101 W. Madison St., Chicago, Ill.

DEALERS and servicemen. Used refrigerators "As Is." Recondition, spray them yourself, save money. Frigidaire \$19.00 up. Kelvinators \$15.00 up. Copelands, \$15.00 up. General Electrics \$19.00 up. Electrolux, Gibsons, Majestics, Bohn, Servels, Ice-O-Matics, Graybars, Coldairs, Lectrice, Holmes, G & S 1/4 h.p. Frigidaire units. Others from 1/4 h.p. to 1 h.p. \$12.50 up. PILGRIM REFRIGERATION CO., 43-47 39th Place, Long Island City, N. Y.

MODERNIZE your old refrigerators with black modernistic 4-inch legs at only a dollar per set. Made to fit all makes of boxes. Send your list of surplus materials to us. ESCOL JOBBING CO., 2323 E. 70th Place, Chicago, Ill.

FRIGIDAIRE MODEL G twin cylinder highside 1/4 hp., \$24.50. Model S, \$19.50. Model A, \$29.50. Single cylinder \$15.00. Model N, 1/4 hp., \$60.00. Model C, 1 hp., \$90.00. Kelvinator single cylinder \$15.00. Twin cylinder, 1/4 hp., \$30.00; 1/2 hp., \$55.00; 3/4 hp., \$65.00. Copeland 1/4 hp. Model L, complete with motor and compressor in working order, \$4.75. FEDERAL REFRIGERATOR CORPORATION, 57 East 25th Street, New York City.

REPAIR SERVICE

MAJESTIC UNITS; any model, rebuilt or exchanged \$20.00 f.o.b. Chicago. Guarantee six months. All models in stock for prompt exchange. Wholesale only. REFRIGERATION PRODUCTS, INC., 122 W. Illinois St., Chicago, Ill.

GENERAL ELECTRIC monitor top units. Exchanged—rebuilt—a wholesale service for dealers. Large unit replacement stock carried on most types. Our shop equipment includes special tools and machinery essential to reoperate these hermetics properly. We do not experiment on your units. We have been successfully rebuilding General Electric units for over three years. The unit returned to you will resemble a new one in operation, appearance and current consumption. Our price is low for the quality of work furnished. When writing give all information as on name plate in front of the control switch. Units guaranteed for one year against defective operation. REX REFRIGERATION SERVICE, INC., 446-48 E. 79th St., Chicago, Ill.

GENERAL ELECTRIC sealed units repaired, exchanged. Work guaranteed. Majestic units rebuilt, exchanged, \$20.00. Satisfied customers in all parts of the United States. Give model when writing. REFRIGERATOR ENGINEERING PARTS & SERVICE CO., 2800 So. Parkway, Chicago, Ill.

SAVE MONEY on electric motor repairs. We rebuild and rewind thousands of motors yearly for largest refrigeration firms in the East and can save you money on your motor problems. Write for our price schedule for rewinding or rebuilding motors for refrigeration, oil burners, washing machines, motor stokers, and air condition motors. Out of town motors are picked up and delivered by our motor transportation service. Write for our dealers' price list. P. J. QUINN'S SONS, INC., 166 Vernon Ave., Long Island City, N. Y.

MAJESTIC UNITS repaired \$17.50. General Electric units, \$30.00. Send your Majestic units to Ft. Smith and get them fixed right. We positively guarantee that we can make Majestics freeze as fast as when new. PENO SERVICE CO., Ft. Smith, Ark.

FRIGIDAIRE plain T two temperature valves \$2.50. Mercoide No. 848 controls complete with tube \$5.00. Try Warren for stuck-up compressors. Samples available. Thermostats, float valves, and expansion valves rebuilt. Prompt service. Same day shipment on refrigerant gases. HALELECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

Patents

Issued June 2, 1936

2,042,493. FLOODED EVAPORATOR. Leonard W. Atchison, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Aug. 28, 1935. Serial No. 38,187. 11 Claims. (Cl. 62-126.)

2,042,496. MULTISTAGE ROTARY COMPRESSOR. Karl Baumann, Wilmslow, England, assignor to General Electric Co., a corporation of New York. Application Feb. 12, 1935. Serial No. 6,183. In Great Britain Feb. 19, 1934. 1 Claim. (Cl. 230-130.)

2,042,497. REFRIGERATING MACHINE. Harley H. Bixler, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application May 24, 1935. Serial No. 23,178. 10 Claims. (Cl. 62-115.)

2,042,507. EVAPORATOR FOR REFRIGERATING APPARATUS. William D. Collins, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application May 17, 1932. Serial No. 611,829. 1 Claim. (Cl. 62-126.)

2,042,517. REFRIGERATING APPARATUS. Don G. Ellis, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application Jan. 15, 1934. Serial No. 706,699. 7 Claims. (Cl. 211-93.)

2,042,523. REFRIGERATING APPARATUS. Frank O. Graham, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application May 31, 1934. Serial No. 728,361. 1 Claim. (Cl. 137-153.)

2,042,533. ROTARY PUMP, BLOWER, OR COMPRESSOR AND THE LIKE. Walter Kieser, Berlin, Germany, assignor to General Electric Co., a corporation of New York. Application June 21, 1934. Serial No. 731,635. In Germany Nov. 20, 1933. 1 Claim. (Cl. 230-116.)

2,042,558. EVAPORATOR. Carl H. Steenstrup, Niskayuna, N. Y., assignor to General Electric Co., a corporation of New York. Application Aug. 28, 1935. Serial No. 38,204. 6 Claims. (Cl. 62-126.)

2,042,568. REFRIGERATION SYSTEM. Clarence D. Tuska, Philadelphia, Pa., assignor to Atwater Kent Mfg. Co., Philadelphia, Pa., a corporation of Pennsylvania. Application Sept. 29, 1934. Serial No. 746,104. 5 Claims. (Cl. 62-4.)

2,042,691. STUFFING BOX. Walter W. Williams, Bloomington, Ill. Application Aug. 30, 1934. Serial No. 742,115. 5 Claims. (Cl. 286-11.)

2,042,694. COOLING UNIT. Glenn F. Zellhoefer, Bloomington, Ill. Application Feb. 6, 1935. Serial No. 5,163. 5 Claims. (Cl. 62-119.)

2,042,812. REFRIGERATION APPARATUS. Robert H. Tull and Bartell J. Homkes, Springfield, Mass., assignors to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application Feb. 23, 1934. Serial No. 712,599. 10 Claims. (Cl. 62-4.)

2,042,920. WATER-VAPOR REFRIGERATING APPARATUS. George H. Woodard, Phillipsburg, N. J., and John Kirgan, Easton, Pa., assignors to Ingersoll-Rand Co., Jersey City, N. J., a corporation of New Jersey. Application Sept. 26, 1934. Serial No. 745,536. 16 Claims. (Cl. 62-152.)

2,042,925. AUTOMATIC RECLOSING CIRCUIT BREAKER SYSTEM. Arthur Herbert Curtis, Bedford, England, assignor, by mesne assignments, to Cutler-Hammer, Inc., Milwaukee, Wis., a corporation of Delaware. Application March 5, 1926. Serial No. 92,426. In Great Britain March 12, 1925. 4 Claims. (Cl. 175-294.)

2,043,176. COOLING UNIT. Maxwell R. Karge, Brockport, N. Y. Application April 16, 1932. Serial No. 605,683. 7 Claims. (Cl. 62-141.)

2,043,191. REFRIGERATING METHOD AND APPARATUS. Walter E. Carpenter, Belmar, N. J., assignor to The Dickerson Co., Newark, N. J., a corporation of New Jersey. Application July 27, 1935. Serial No. 33,490. 12 Claims. (Cl. 62-95.)

2,043,217. METHOD AND MEANS FOR CONTROLLING THE IONIC CONTENT OF AIR. Constantin P. Yaglou, Boston, Mass., assignor, by mesne assignments, to Carrier Engineering Corp., Newark, N. J., a corporation of New York. Application May 4, 1933. Serial No. 669,362. 9 Claims. (Cl. 204-32.)

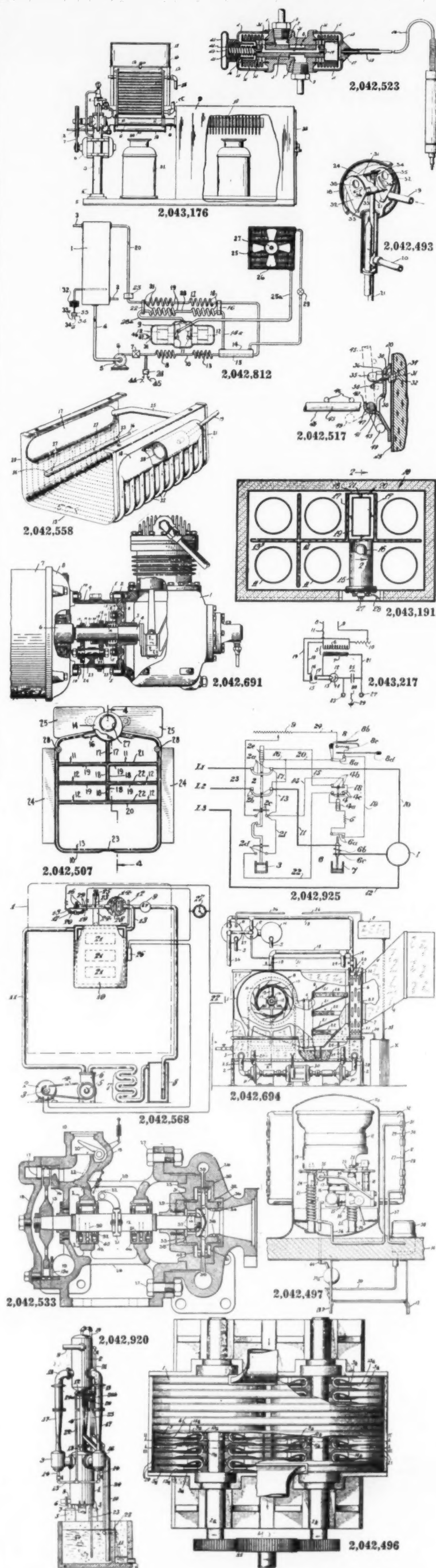
Bender Will Distribute Holcomb & Hoke Cases

INDIANAPOLIS—Holcomb & Hoke Mfg. Co. recently appointed Julius Bender, Inc., Chicago, Ill., as distributor of its line of refrigerated display cases in the Illinois and Indiana territory.

Three new dealers also appointed to handle the H. & H. line are: Pardee-Aldrich Electric Co., Charleston, S. C.; Seastrunk Electric Co., Columbia, S. C.; V. Tausche Hardware Co., La Crosse, Wis.

May shipments of H. & H. display units exceeded those for any year in the company's history. June orders show a marked increase, and field reports indicate that prospects for 1936 sales are brighter than any time in the last six years, company officials assert.

Illustrations of Patents Issued June 2



Service Methods

A Service Man Seeks Data on Operating Pressures, Gauge Port Adaptors and Sources of Replacement Parts

Goodley & Shobe
Middletown, Del.

Editor:

Recently I purchased a copy of your MASTER SERVICE MANUAL in which I expected to find all I needed to know about servicing the different makes of refrigerators. However, there were a few things that I could not find out by reading the book. Will you please answer the following questions or tell me where I can get the information I want.

For every type of compressor there is a normal high and low pressure, is there not? How can I find out what those pressures should be for the different refrigerators?

Your chart gives the vapor pressures for the different refrigerants, but as I understand it, the compressor must exert a pressure greater than this pressure to cause the gas to liquefy. For instance, on a Norge vapor pressure at 70° F. is 34.5 lbs. while the condenser pressure for 1/2 to 3/4 hp. units is 58.5 lbs., the temperature being the temperature of the air in front of the machine compartment.

Also, the pressure indication of an efficient Rollator is 20 inches of vacuum with the suction service valve closed.

How can I find out what type and size couplings or adaptors are necessary for testing the different refrigerators? For instance the gauge ports on one make of refrigerator may not be the same size as those on another make.

I need to know these things to be prepared to service any refrigerator I am called on to fix. At present we are handling Norge refrigerators and I have the dope on them, but I don't have it on any of the other makes.

Another thing I need to know is how to get replacement parts for the different makes from a wholesale company that sells these parts for all makes of machines. Can they supply the part needed if I just send in the order telling them what part I need and what make and year the refrigerator is? Is it necessary to know any of the designating numbers or the sizes?

If you will answer these questions or tell me where I can get the desired information I will be very thankful for the information.

JAMES D. SHOBE.

Answer: It is true that for every type of a household electric refrigeration system there is a high and low pressure side. To find out exactly what these pressures should be for different refrigerators, it is a little difficult unless you have a service manual covering the particular make and model in question.

It may interest you to know that we are at this time preparing for publication excerpts from domestic service manuals on all of the different makes and models that we can

possibly obtain giving the information as to the refrigerant used, the amount of refrigerant and oil, bore and stroke pressure, speed, motor size, and the approximate operating pressure along with cut-away views of the compressor and other parts of the system that are pertinent to service.

Master Service Manual Gives Normal Pressure Range

In Paragraph 6, page 25 of the MASTER SERVICE MANUAL, under "Sulphur Dioxide," it is stated that under very favorable conditions the approximate operating head pressure in an air-cooled system using SO₂ should be from 3 lbs. below the temperature of the cooling medium to 5 lbs. above the temperature of the cooling medium.

This operating head pressure, however, may vary a few pounds each way depending on the size and type of the condenser, the efficiency of the fan, and whether or not the condenser is clean.

Page 27, paragraph 3, under methyl chloride, a comparison is made showing the operating head pressure of a system using methyl chloride to be from 15 lbs. to 30 lbs. above the temperature of the cooling medium.

It will be noted then that different refrigerants have different operating head pressures and there can be no set rule as to exactly what these head pressures should be.

In paragraph 3, page 25, under "SO₂" it is pointed out that the average operating back pressure (pressure on the low side of the system) is usually 0 lbs. gauge to 6 in. of vacuum resulting in an average refrigerant temperature of 10° F. Under the same condition for methyl chloride, the average back pressure will range from 6 lbs. to 11 lbs. gauge to result in an average refrigerant temperature of 10° F.

When an automatic expansion valve is used, the operating back pressure during the on-cycle is steady, while with the low side float and high side float or thermostatic expansion valve, the operating back pressure decreases with temperature of the refrigerator and the refrigerant during the entire cycle. These fundamental facts are very clearly discussed in Chapter 5 of the MASTER SERVICE MANUAL, which covers evaporators and refrigerant controls.

To answer the third paragraph of your letter as to what type and size of couplings or adaptors are necessary for testing the different refrigerators, to the best of our knowledge compressor gauge ports are made in two sizes only. Namely, 1/4 in. female pipe and 1/4 in. female pipe.

The ordinary service kit should be equipped with two or more 1/4 in. male pipe x 1/4 in. S.A.E. connectors, two 1/4 in. male pipe x 1/4 in. S.A.E. elbows, two 1/4 in. male pipe x 1/4 in. S.A.E. connectors, and two 1/4 in. male pipe x 1/4 in. S.A.E. elbows.

This combination of fittings should provide suitable connections for any make of electric refrigerator of the open conventional type equipped with standard shut-off valves.

Give Complete Information In Ordering Parts

In the fourth paragraph of your letter, you ask how to get replacement parts for the different makes from the wholesale companies that sell these parts for all makes of machines, and further can they supply the part needed if you send in your order telling them what parts you need and what make and year the refrigerator is, and if it is necessary to know the designating numbers or the sizes.

Replacement parts for a number of the refrigerators are carried in stock by the leading refrigeration supply jobbers. It is often confusing to these jobbers when an order is received for a part which is not properly described.

It is suggested that catalogs be requested from these jobbers or manufacturers of replacement parts, and in ordering, always specify the manufacturer's or the jobber's part number.

Replacement parts are not available for all the different makes of refrigerators on the market. Where these are not available from the supply jobber, it is necessary then to communicate with the factory which originally made the refrigerator, for these repair parts. When a part number or an adequate description of the part cannot be supplied when ordering parts, it is then suggested that a sample of the actual part desired be forwarded along with your order to the supplier.

Alter Issues New 96-Page Catalog

CHICAGO—The Harry Alter Co., wholesale distributor of air-conditioning and commercial and domestic refrigeration parts and supplies, has just brought out a 96-page summer catalog, listing the complete line of equipment which it carries for dealers and service men.

A special insert in the catalog lists and describes the line of Mills compressors and high sides, distribution of which the Alter company took over recently. The machines, ranging in size from 1/2 to 7 1/2 hp., are manufactured by Mills Novelty Co., a recent entry into the commercial refrigeration field.

Listing of Control Equipment

Other important additions to Alter catalog include a complete listing of Detroit Lubricator Co. air-conditioning controls, and a revised listing of refrigeration replacement gaskets, making easier the selection and ordering of these items. Several new tools and other types of equipment have also been added to the Alter stock list.

Refrigeration parts listed in detail include Imperial Brass Co. fittings, Rotary seals, Perfection refrigeration parts, Penn. Ranco, Detroit Lubricator, Square D, and Cutler-Hammer controls, and Fedders equipment. Chieftain and Dayton compressors and Westinghouse capacitor-type motors are also listed.

Equipment for Service Men

A complete page has been devoted to thermometers, psychrometers, humidimeters, and other equipment for the service man.

Inside back cover of the catalog contains a list of technical books and trade papers for service men, including ELECTRIC REFRIGERATION NEWS and other publications of Business News Publishing Co.

Since the company is committed to a strictly wholesale policy, officers have announced that catalogs will be obtainable only by accredited dealers and service men.

Imperial Brass Holds Sales Meeting

CHICAGO—Imperial Brass Mfg. Co. held its semi-annual meeting for members of its sales organization at the company's headquarters here recently.

Central feature of the program of daily meetings held from Monday to Friday was a dinner at the Hamilton Club, at which speeches were given by Frank McNellis, president, W. A. Leonard, vice president, and other company executives. Harry Alter, president of the Harry Alter Co., Chicago, was among the principal guest speakers.

Imperial Brass Mfg. Co.'s new catalog 77-E, covering its complete line of products, was also shown at the meetings.

Refrigerator Parts Dept. Of Borg Warner Moves

CHICAGO—Borg Warner Parts Co. of this city, a division of Borg-Warner Corp., has recently expanded and moved its refrigeration department to new quarters.

Located at 21st St. and Indiana Ave., the refrigeration department occupies more than 6,000 sq. ft. of ground floor space. Parts are stocked on steel shelving, and display cases are indirectly illuminated.

With 14 warehouses located throughout the country, Borg Warner Service Parts Co. has been for many years one of Chicago's leading distributors of automotive parts. Its refrigeration department has been in operation for over a year. A. C. Darling is vice president and general manager.

Wholesale Radio Issues Address System Catalog

NEW YORK CITY — Wholesale Radio Service Co., Inc., distributor of radio replacement parts and supplies, has just issued Catalog No. 64, describing its line of Lafayette public address equipment.

The company is now devoting its attention exclusively to the radio field, having sold its refrigeration parts business to Harry Alter Co., Chicago (ELECTRIC REFRIGERATION NEWS, May 27).

Cutler-Hammer Moves Los Angeles Office

LOS ANGELES — Local office of Cutler-Hammer, Inc., Milwaukee, manufacturer of electric motor control apparatus, has been moved to new quarters at 1331 Santa Fe Avenue, where a complete stock of C-H standardized motor control, safety switches and electrical specialties will be carried. The office is in charge of W. G. Tapping.

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